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**SITE SENSITIVITY VERIFICATION
AND
AGRICULTURAL COMPLIANCE STATEMENT
FOR THE PROPOSED LANGSIDE RENEWABLE ENERGY FACILITY
AND ASSOCIATED INFRASTRUCTURE
NEAR KOMANI, EASTERN CAPE PROVINCE**

**Report by
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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 offers a valuable opportunity for integrating renewable energy with agricultural production in a way that provides benefits to agriculture but leads to no loss of viable arable land and therefore minimal loss of future agricultural production potential.

The screening tool classifies the assessed area as ranging from low to medium agricultural sensitivity, which is due to the land capability rating of between 7 and 8. This assessment confirms the low to medium sensitivity rating of the screening tool because of the agricultural production potential and current agricultural land use.

An agricultural impact is a change to the future agricultural production potential of land. In this case, the assessed 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 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 Langside Renewable Energy Facility near Komani, Eastern Cape Province (see location in Figure 1). In terms of the National Environmental Management Act (Act No 107 of 1998 - NEMA), an application for environmental authorisation requires an agricultural assessment. In this case, based on the verified low to medium agricultural sensitivity of the total infrastructural footprint of the project (see Section 7), the level of agricultural assessment required by the agricultural protocol is an Agricultural Compliance Statement.



Figure 1. Locality map of the development (dark blue outline) south-west of the town of Komani.

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 IPP substation; 132kV grid connection, including an Eskom switching station and overhead power line; temporary construction laydown areas; and perimeter fencing. The facility will have a total generating capacity of up to 30 MW.

The exact nature and layout of the different infrastructure within the boundary fence of a solar energy facility has absolutely no bearing on the significance of agricultural impacts. It is therefore not necessary to detail this design and layout of the facility any further in this assessment. All that is of relevance is simply the total footprint of the facility that excludes agricultural land use or impacts agricultural land, referred to as the agricultural footprint. This is the area within the facility fence. Whether that footprint comprises, for example, a solar array, a road, or a BESS is irrelevant to agricultural impact. The total agricultural footprint of the facility, as shown in Figures 2 and 3, is 76 hectares.

This assessment includes the impact of the grid connection. However, a power line has negligible agricultural impact and is therefore not considered to be part of the agricultural footprint of a renewable energy facility in NEMA's agricultural protocol. The associated Eskom switching station is entirely located within the facility fence and therefore does not add in any way to the agricultural impact of the facility as assessed in this report. It is therefore not necessary to detail the grid connection design any further in this assessment.

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 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

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

given after it in brackets.

1. The Agricultural Compliance Statement must be prepared by a soil scientist or agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP) **(Appendix 3)**.
2. The compliance statement must:
 1. be applicable to the preferred site and proposed development footprint **(Figures 2 and 3)**;
 2. confirm that the site is of “low” or “medium” sensitivity for agriculture **(Section 7)**; and
 3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site **(Section 12)**.
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 11.3)**;
 5. confirmation that the development footprint is in line with the allowable development limits contained in Table 1 of the protocol **(Section 11.3)**;
 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 11.1)**;
 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 12)**;
 8. any conditions to which this statement is subjected **(Section 12)**;
 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 11.2)**;
 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

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 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 Environmental Authorisation. There are two approvals that apply. The first is a No Objection Letter for the change in land use. This letter is one of the requirements for receiving municipal rezoning. This application requires a motivation backed by good evidence that the development is acceptable in terms of its impact on the agricultural production potential of the development site. This agricultural assessment report will serve that purpose.

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

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 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 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

A specialist agricultural assessment is required to verify the agricultural sensitivity of the development site as per the sensitivity categories used by the web-based environmental screening tool of the Department of Forestry, Fisheries and the Environment (DFFE). However, such an exercise is of very limited value once the agricultural assessment, which supersedes any screening tool result, has been done. What is of much more importance to this assessment than the site sensitivity verification, is its assessment of the cropping potential (see Section 8) and its assessment of the impact significance (see Section 9).

The screening tool 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 course data. The two criteria are:

1. whether the land is classified as cropland or not on the field crop boundary data set, and
2. its land capability rating on the land capability data set

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 Department of Agriculture'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 screening tool's agricultural sensitivity is shown in Table 1.

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

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

The agricultural sensitivity of the site, as given by the screening tool, is shown in Figure 2.



Figure 2. The assessed area (dark blue outline) and grid connection infrastructure (black polygon) overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high). The screening tool's low to medium sensitivity is confirmed by this assessment.

The screening tool classifies the assessed area as ranging from low to medium agricultural sensitivity, which is due to the land capability rating of between 7 and 8. This assessment confirms the low to medium sensitivity rating of the screening tool because of the agricultural production potential and current agricultural land use.

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).

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

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.

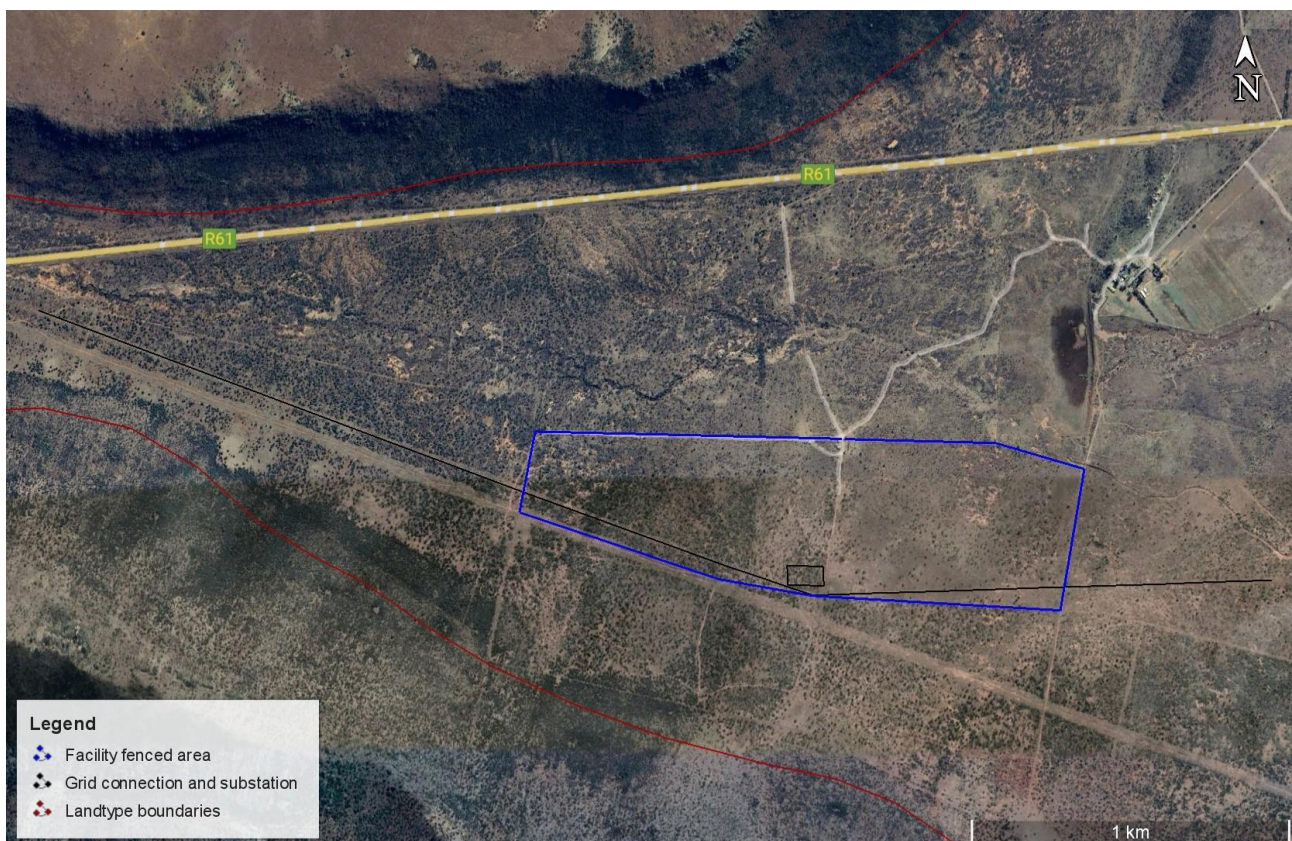


Figure 3. Satellite image map of the development Footprint.

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

	Parameter	Value
Climate	Köppen-Geiger climate description (Beck <i>et al</i> , 2018)	Arid, steppe, hot
	Mean Annual Rainfall (mm) (Schulze, 2009)	464
	Reference Crop Evaporation Annual Total (mm) (Schulze, 2009)	1359
	Climate capability classification (out of 9) (DAFF, 2017)	Between 4 (low-moderate) and 5 (moderate), but predominantly 4
Terrain	Terrain type	Eastern Cape hills
	Terrain morphological unit	Foot slope
	Slope gradients (%)	0-8
	Altitude (m)	1100
	Terrain capability classification (out of 9) (DAFF, 2017)	Between 6 (moderate-high) and 7 (high)
Soil	Geology (DAFF, 2002)	Brownish red and grey mudstone of the Burgersdorp Formation, Karoo Sequence with intrusives of dolerite.
	Land type (DAFF, 2002)	Da166
	Description of the soils	Predominantly very shallow to deep, medium to heavy textured soils on underlying rock or structured clay
	Dominant soil forms	Swartland, Sterkspruit, Oakleaf
	Soil capability classification (out of 9) (DAFF, 2017)	Between 4 (low-moderate) and 5 (moderate), but predominantly 5
	Soil limitations	Limited soil depth
Land use	Agricultural land use in the surrounding area	Grazing, dry land crop production, irrigation
	Agricultural land use on the site	Grazing
General	Long-term grazing capacity (ha/LSU) (DAFF, 2018)	9 (very high)
	Land capability classification (out of 15) (DAFF, 2017)	Between 7 (low-moderate) and 8 (moderate)
	Within Protected Agricultural Area (DALRRD, 2020)	No

8.1 Assessment of the agricultural production potential

The arid climate (mean annual rainfall of 464 mm and evaporation of 1359 mm) 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 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 9 hectares 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.

9 ASSESSMENT OF THE AGRICULTURAL IMPACT

9.1 Impact identification and assessment

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

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

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

The most significant 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 land that is only good enough to be used for grazing (the remaining 87% of

the country). 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 financial security and cash flow and improve farming operations and productivity on other, higher potential parts of the farms, through increased investment into farming.

This assessment includes the impact of the grid connection. However, a power line has negligible agricultural impact because the land underneath it is not excluded from agricultural use. The associated Eskom switching station is entirely located within the facility fence and therefore does not add in any way to the agricultural impact of the facility as assessed in this report.

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 environmental authorisation 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 this:

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

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

This cumulative impact assessment determines the quantitative loss of agricultural land if all renewable energy project applications within a 30 km radius become operational. The project being assessed in this report is the only renewable energy application within a 30 km radius. In quantifying the cumulative impact, the area of land taken out of agricultural use as a result of this project amounts to a total of approximately 76 hectares. As a proportion of the total area within a 30 km radius (approximately 282,700 ha), this amounts to only 0.03% 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.

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 lower potential agricultural land in a region which has been designated as a Renewable Energy Development Zone (REDZ), than to lose agricultural land that has a higher

potential, and that is much scarcer, to renewable energy development elsewhere in the country. The area has been declared a REDZ precisely because it is an environment that can accommodate numerous renewable energy developments without exceeding acceptable levels of loss of agricultural production potential. This is primarily because of the availability of land that is limited to only being suitable for grazing within the REDZ, and the fact that such land is not a scarce resource in South Africa.

Due to its negligible agricultural impact, the assessed grid connection infrastructure cannot exceed acceptable levels of change in terms of agricultural land loss, no matter how much grid infrastructure exists. In reality, the landscape could be covered with power lines and agricultural production would continue, largely unaffected. It therefore makes no sense to conduct a more formal assessment of cumulative power line impacts as per DFFE requirements. The cumulative impact of the grid connection can confidently be assessed as being of very low significance and therefore as acceptable. It will not have an unacceptable negative impact on the agricultural production capability of the area.

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.

9.3 Assessment of alternatives

Specialist assessments for environmental authorisation 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 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it remains at the surface. Topsoil should only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire cut surface. It will be advantageous to have topsoil and vegetation cover below the panels during the operational phase to control dust and erosion.

10.2 Inputs to the Environmental Management Programme

The inputs to the Environmental Management Programme are detailed in the tables below 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	Design an effective system of	Ensure that the storm water run-off control	Once-off during the design phase.	Holder of the EA

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
	of hard surfaces causes no erosion on or downstream of the site.	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.	is included in the engineering design.		

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	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm	Every 2 months during the construction phase	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		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.	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.		
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 below surface in any way, then any available topsoil should first be stripped	Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and	As required, whenever areas are disturbed.	Environmental Control Officer (ECO)

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		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.	replacement. Check that topsoil covers the entire disturbed area.		

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	That 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	Bi-annually	Facility Environmental Manager

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
			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 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	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system	Every 2 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved.	Environmental Control Officer (ECO)

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

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

11 ADDITIONAL ASPECTS REQUIRED IN AN AGRICULTURAL ASSESSMENT

11.1 Micro-siting

The agricultural protocol 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. Furthermore, the facility has avoided all croplands to minimize fragmentation and disturbance of agricultural activities.

11.2 Confirmation of linear activity

The agricultural protocol 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 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 30 MW to occupy an agricultural footprint of $30 \times 2.5 = 75$ hectares. The assessed area as shown in Figures 2 and 3 is 76 hectares, which means that the facility is not in line with the allowable development limits contained in the agricultural protocol. However, the purpose of the allowable development limits is to conserve higher potential, predominantly arable, agricultural land by steering renewable energy development off such land and onto lower potential land. In this case the facility has already been located on land that is of insufficient land capability to be viable as cropland and is therefore the land onto which renewable energy developments should be steered. Compliance with the allowable development limits is therefore unnecessary because their purpose has already been achieved in this case.

12 CONCLUSION: AGRICULTURAL COMPLIANCE STATEMENT

The overall conclusion of this assessment is that the proposed development offers a valuable opportunity for integrating renewable energy with agricultural production in a way that provides benefits to agriculture but leads to no loss of viable arable land and therefore minimal loss of future agricultural production potential.

The screening tool classifies the assessed area as ranging from low to medium agricultural sensitivity, which is due to the land capability rating of between 7 and 8. This assessment confirms the low to medium sensitivity rating of the screening tool because of the agricultural production potential and current agricultural land use.

An agricultural impact is a change to the future agricultural production potential of land. In this case, the assessed 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 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/>.

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/>

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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 Consultors 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

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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 LANGSIDE SOLAR ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR QUEENSTOWN, EASTERN CAPE PROVINCE

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:

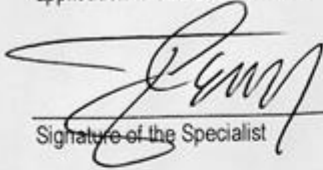
9 November 2023

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.



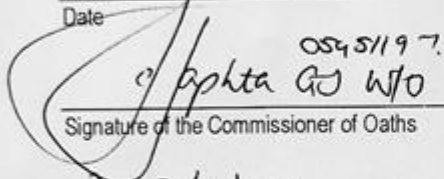
Signature of the Specialist

Johann Lanz – Soil Scientist – sole proprietor

Name of Company

9 November 2023

Date

 OS 5/197
Siphtha GQ W/O

Signature of the Commissioner of Oaths

2023/11/09

Date





herewith certifies that

Johan Lanz

Registration Number: 400268/12

is a registered scientist

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

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

Soil Science (Professional Natural Scientist)

Effective **15 August 2012**

Expires **31 March 2024**



A handwritten signature in black ink, appearing to read 'A. M. ...', positioned above a horizontal line.

Chairperson

A handwritten signature in black ink, appearing to read 'N. ...', positioned above a horizontal line.

Chief Executive Officer



APPENDIX 4: PROJECTS INCLUDED IN CUMULATIVE IMPACT ASSESSMENT

Table 6: Table of all projects that were included in the cumulative impact assessment.

DFFE Reference	Project name	Technology	Capacity (MW)
TBC	Langside Solar	Solar	30
Total			30

APPENDIX 5: SOIL DATA

Table 7: Table of land type soil data

Land type	Soil series (forms)	Depth (mm)	Clay % A horizon	Clay % B horizon	Depth limiting layer	% of land type
Da166	Sw	100 - 400	15 - 25	15 - 35	vr,vp	26,9
Da166	Ss	200 - 600	10 - 25	25 - 40	pr	26,0
Da166	Oa	600 > 1200	15 - 35	20 - 35	sl,U	22,5
Da166	Va	200 - 500	25 - 40	30 - 60	vr,vp	13,0
Da166	Hu	150 - 400	15 - 25	15 - 35	lc,R	3,6
Da166	Gs	100 - 300	10 - 25	20 - 35	lc,R	2,8
Da166	Du	600 > 1200	10 - 35		sl	2,0
Da166	R					1,7
Da166	Ms	100 - 300	10 - 25		R	1,2
Da166	S					0,5