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SITE SENSITIVITY VERIFICATION AND AGRICULTURAL COMPLIANCE STATEMENT FOR ROAN 2 PV FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR HAARTBEESFONTEIN, NORTH-WEST PROVINCE

Report by
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EXECUTIVE SUMMARY

The key findings of this study are:

- The entire site was verified in this assessment as being of medium sensitivity for impacts on agricultural resources with a maximum land capability value of 7. Parts of the site are allocated high agricultural sensitivity on the screening tool. However, this was disputed because the land is no longer under crop production and was assessed as being of insufficient land capability for viable and sustainable future crop production.
- The cropping potential of the site is limited by the combination of a marginal climate and soils with limited, water holding capacity due to depth limitations.
- Two potential negative agricultural impacts were identified, loss of agricultural land use, and land degradation.
- Two positive agricultural impact were identified as enhanced agricultural potential through increased financial security for farming operations, and improved security against stock theft and other crime.
- These agricultural impacts are likely to have low impact on levels of agricultural production and are therefore assessed as having low significance.
- The amount of agricultural land loss caused by the project is within the allowable development limits prescribed by the agricultural protocol to ensure appropriate conservation of agricultural production land and national food security. The site was assessed as being of insufficient land capability to support viable and sustainable future crop production. It is therefore considered to be below the threshold for being prioritised for conservation as agricultural production land and its loss as agricultural production land is therefore assessed as being of low significance.
- The recommended mitigation measures are implementation of an effective system of stormwater run-off control; maintenance of vegetation cover; and stripping, stockpiling and re-spreading of topsoil.
- The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. This is substantiated by the facts that the land is of insufficient land capability for crop production; the amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol; the proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, improved security against crime, as well as wider, societal benefits; the loss of agricultural potential by occupation of land is not permanent; the proposed development is in a REDZ designated for the prioritisation of renewable energy development; and that the proposed development poses a low risk in terms of causing soil degradation.
- The proposed development is therefore acceptable and from an agricultural impact point

of view, it is recommended that the development be approved.

1 INTRODUCTION

Environmental authorisation is being sought for the Roan 2 PV facility and associated infrastructure near Haartbeesfontein, North-West 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 sensitivity of the site, the level of agricultural assessment required is an Agricultural Compliance Statement.

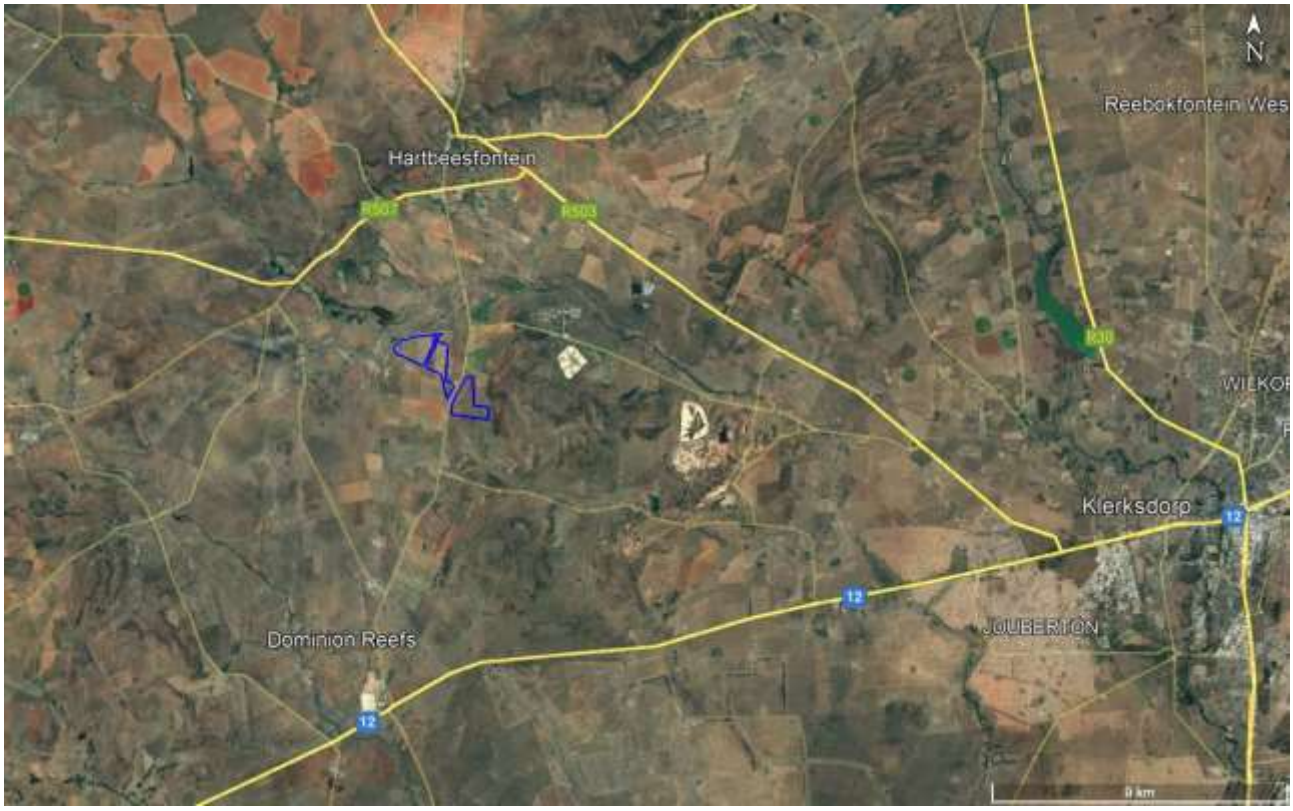

Figure 1. *Locality map of the proposed PV facility, south of the town of Hartbeesfontein.*

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

The whole idea behind including an agricultural component in Environmental Authorisation is to ensure that South Africa balances the need for development against the need to ensure the conservation of the natural agricultural resources, including land, required for agricultural production and national food security. The purpose is primarily to preserve scarce arable land for crop production, by ensuring that such land is not inappropriately used for non agricultural development or impacted to the extent that the crop production potential is reduced.

However, all land that is excluded from potential future agricultural use by this development has serious limitations for crop production and is therefore not considered particularly preservation-worthy as agricultural production land.

2 PROJECT DESCRIPTION

The proposed facility will consist of the standard infrastructure of a PV facility including PV array; inverters; on-site substation and grid connection; battery storage; auxiliary buildings; access and internal roads; and fencing and will have a total generating capacity of up to 100 MW.

The exact nature and layout of the different infrastructure within a renewable energy facility has absolutely no bearing on the significance of agricultural impacts. It is therefore not necessary to detail the design and layout of the facility any further in this assessment. 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. Whether that footprint comprises a solar array, a road or a substation is irrelevant to agricultural impact. The total agricultural footprint of the facility is approximately 203 hectares.

This assessment includes the power lines of the grid connection. However, it is important to note that the power lines have a very different level of agricultural impact than the solar power plant does because agriculture is not excluded from the land underneath a power line. The power line corridor is not therefore considered to be part of the agricultural footprint. The agricultural impact of a power line is insignificant in this environment, regardless of its route and design and the agricultural potential of the land it traverses.

3 TERMS OF REFERENCE

The terms of reference for this study is to fulfill the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources*, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

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

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

1. The Agricultural Compliance Statement must be prepared by a soil scientist or agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP) **(Appendix 1)**.
2. The compliance statement must:
    1. be applicable to the preferred site and proposed development footprint;
    2. confirm that the site is of "low" or "medium" sensitivity for agriculture **(Section 7)**; and
    3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site **(Section 9.9)**.
3. The Agricultural Compliance Statement must contain, as a minimum, the following information:
    1. details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vitae **(Appendix 1)**;
    2. a signed statement of independence by the specialist **(Appendix 2)**;
    3. a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool **(Figure 2)**;
    4. calculations of the physical development footprint area for each land parcel as well as the total physical development footprint area of the proposed development including supporting infrastructure **(Section 9.8)**;
    5. confirmation that the development footprint is in line with the allowable development limits contained in Table 1 of the protocol **(Section 9.8)**;
    6. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimize fragmentation and disturbance of agricultural activities **(Section 9.6)**;
    7. a substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development **(Section 9.9)**;
    8. any conditions to which this statement is subjected **(Section 11)**;
    9. in the case of a linear activity, confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase **(Section 9.7)**;
    10. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr **(Section 10)**; and
    11. a description of the assumptions made and any uncertainties or gaps in knowledge or data **(Section 5)**.

4 METHODOLOGY OF STUDY

4.1 Methodology for assessing the agro-ecosystem

The assessment was based on an on-site investigation of the soils and agricultural conditions and was also informed by existing soil and agricultural potential data for the site. The following sources of existing information were used:

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

The aim of the on-site Site Sensitivity Verification was to:

1. ground truth the cultivation status and consequent agricultural sensitivity;
2. ground truth the land type soil data and achieve an understanding of specific soil conditions, and the variation of these across the site;
3. assess on-site agricultural conditions.

This was achieved by a drive and walk-over investigation across the site. The site investigation was conducted for several hours on 9 February 2022.

The soil investigation was based on soil auger samples in several places as well as indications of the surface conditions and topography. Soils were classified according to the South African soil classification system (Soil Classification Working Group, 1991). This level of soil assessment is considered entirely adequate for an understanding of on-site soil potential.

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

5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA

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

6 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

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

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

Power lines require the registration of a servitude for each farm portion crossed. In terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA), the registration of a power line servitude requires written consent of the Minister unless either of the following two conditions apply:

- if the servitude width does not exceed 15 metres; and
- if Eskom is the applicant for the servitude.

If one or both of these conditions apply, then no agricultural consent is required. The second condition is likely to apply, even if another entity gets Environmental Authorisation for and constructs the power line, but then hands it over to Eskom for its operation. Eskom is currently

exempt from agricultural consent for power line servitudes.

7 SITE SENSITIVITY VERIFICATION

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

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

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

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

The screening tool sensitivity categories in terms of land capability are based upon the Department of Agriculture's updated and refined, country-wide land capability mapping, released in 2016. The data is generated by GIS modelling. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land, based on its soil, climate and terrain. The higher land capability values (≥8 to 15) are likely to be suitable as arable land for crop production, while lower values are only likely to be suitable as non-arable grazing land.

A map of the proposed development area overlaid on the screening tool sensitivity is given in Figure 2. The land capability of the site on the screening tool is predominantly 7, but varies from 6 to 8. The small scale differences in land capability across the project area are not very significant and are more a function of how the land capability data is generated by modelling, than actual meaningful differences in agricultural potential on the ground. Values of 6 to 8 translate to a

medium agricultural sensitivity.

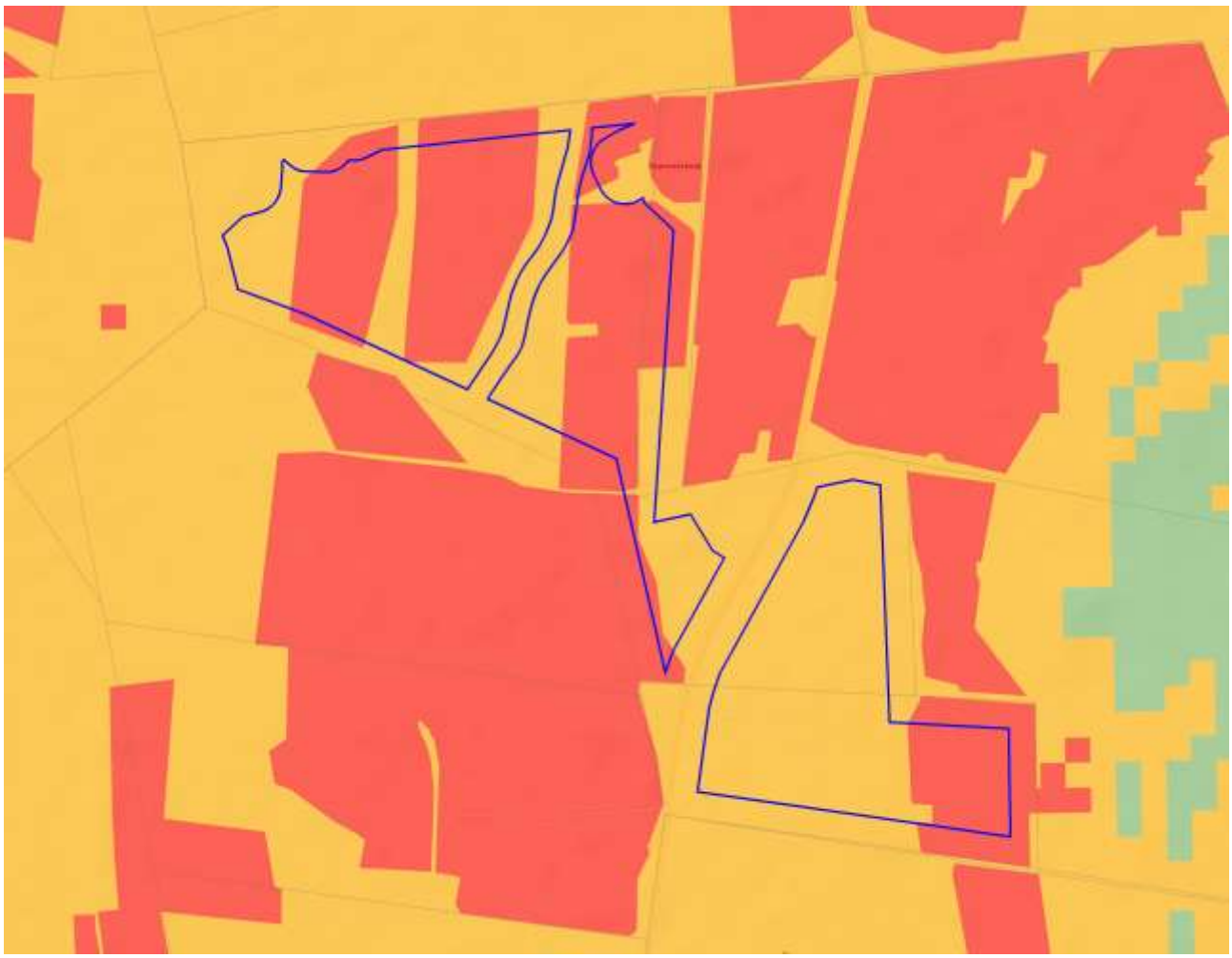

Figure 2. *The proposed agricultural footprint of the development (blue outline) overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high).*

The allocation of high sensitivity to parts of the site (red in Figure 2) are because these parts are classified as cropland in the data set used by the screening tool. However, that data set is outdated. The lands indicated as croplands on the screening tool are not currently under crops and have not been for an extended period. All the lands across the project area are used only for grazing (see Figures 4 to 5). These lands should therefore no longer be classified as cropland or allocated high sensitivity because of it. The combination of climate and soil on this site means that all the land across it is at best very marginal for viable crop production. A high agricultural sensitivity or a land capability of more than 7 is not therefore justified for this site. The high agricultural sensitivity attributed to parts of the site by the screening tool as a result of cropping status is therefore disputed by this assessment.

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

8 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

A satellite image map of the agricultural footprint of the proposed PV facility is shown in Figure 3 and photographs of site conditions are shown in Figures 4 and 5.

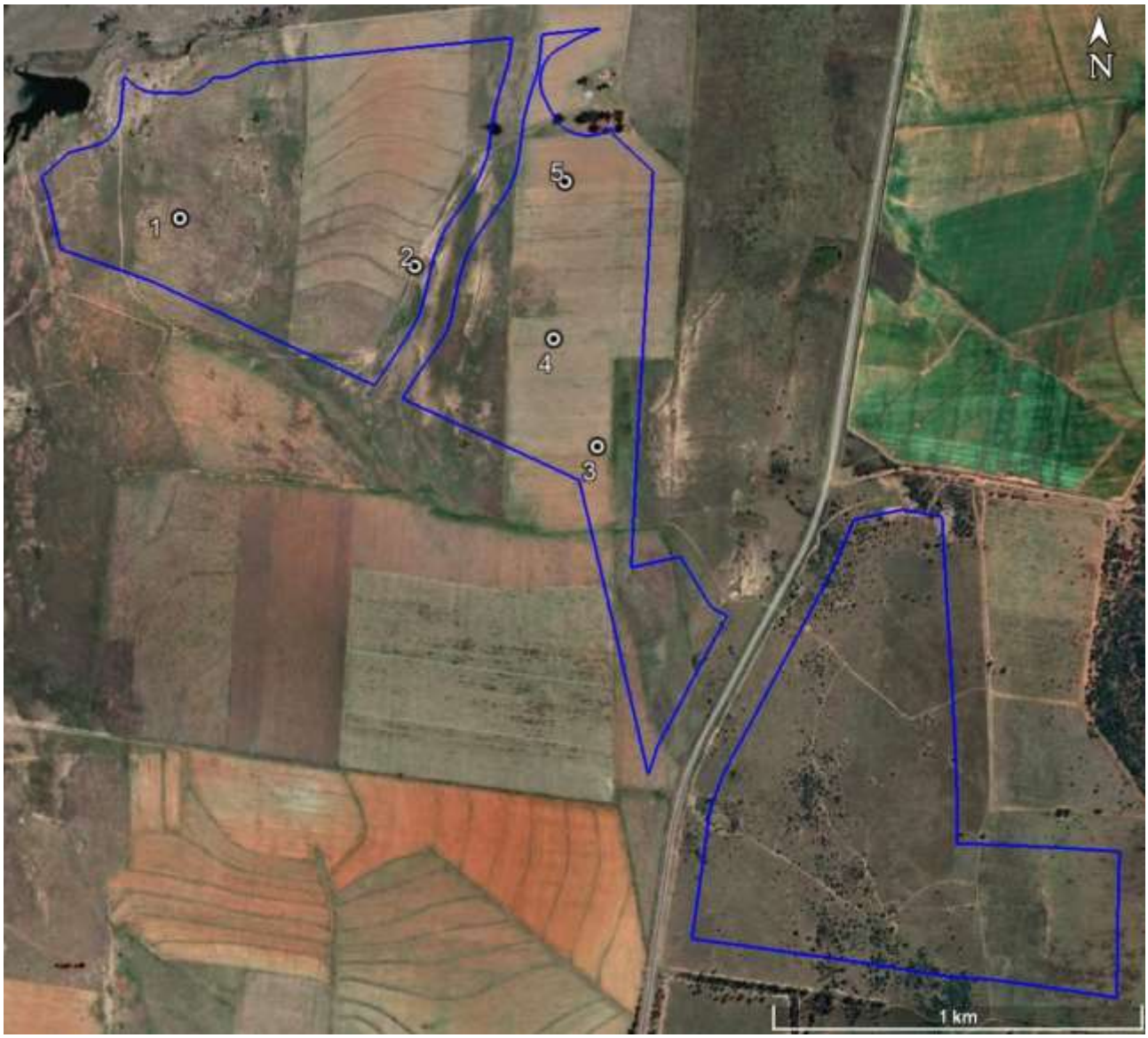

Figure 3. *Satellite image map of the agricultural footprint of the proposed PV facility. Numbered soil auger sample points are shown.*

The site lies across the crest of a ridge so that the northern parts have a northerly aspect and the southern parts have a southerly aspect, with slopes of up to 4%. The geology is Witwatersrand quartzite and shale with Ventersdorp lava. The land type soil data as well as data from investigated soil auger samples across the site is given in Appendix 3. Soils on the ridge line tend to be shallow Mispah and Glenrosa soils on hard underlying bedrock. Rock outcrops also occur. Soils on the slopes are loamy, red Hutton soils, limited in depth by underlying rock. In the wetter, concave parts

of the landscape, poorly drained Westleigh soils occur. Avalon soils occur in the intermediate landscape positions between the Hutton and Westleigh soils.

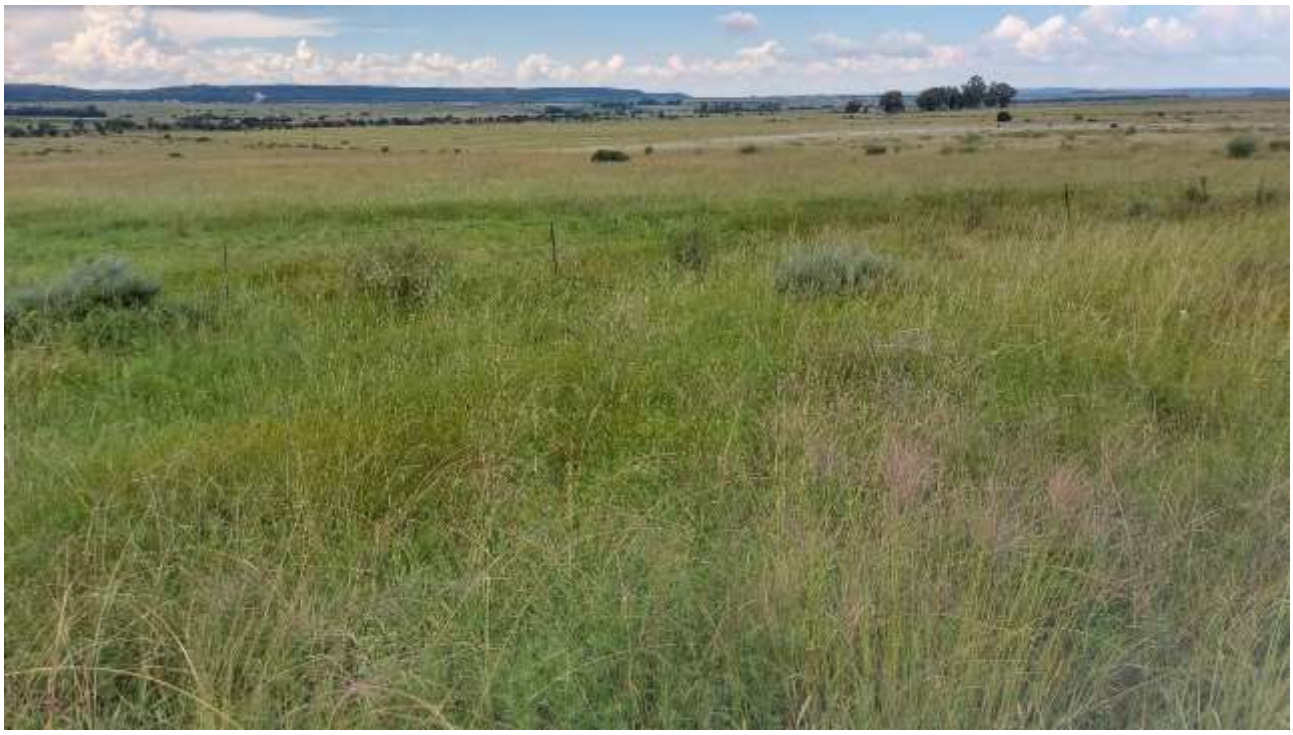

Figure 4. *Typical site conditions.*

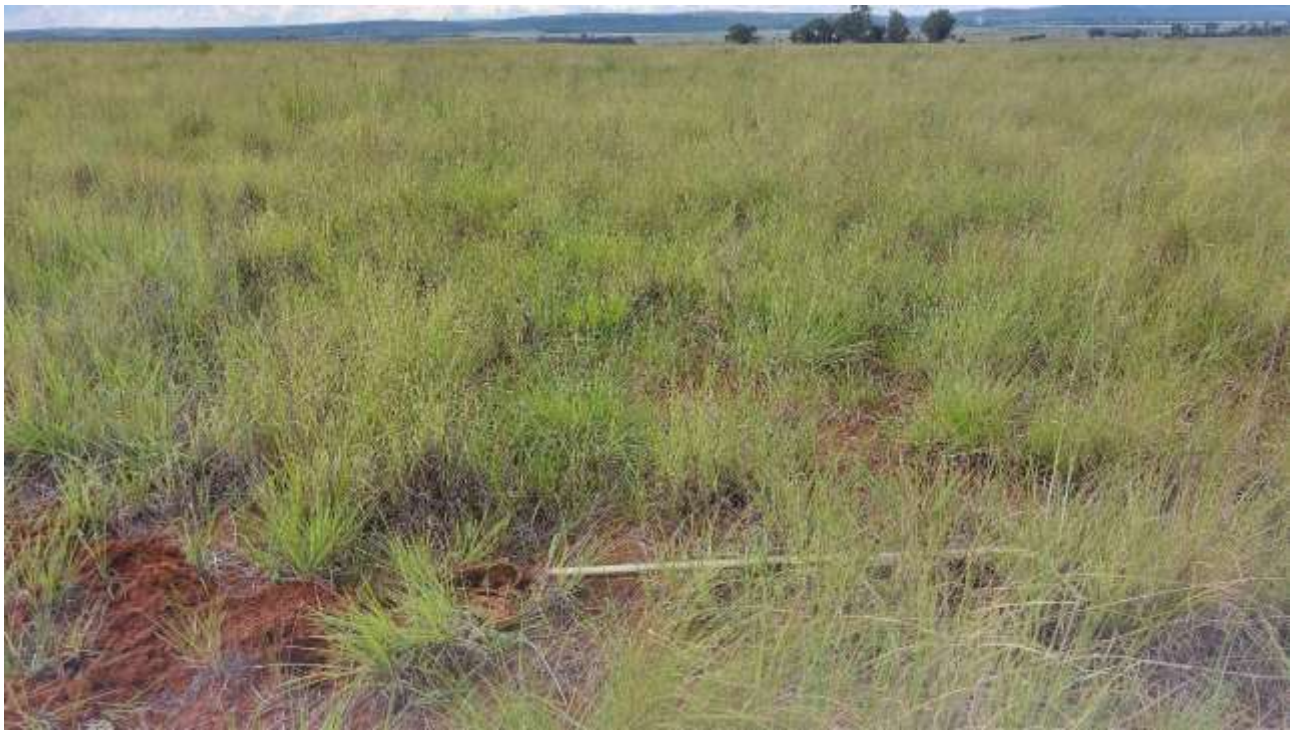

Figure 5. *Typical site conditions, on old crop production lands.*

The cropping potential of the site is limited by the combination of a somewhat marginal climate

(annual rainfall of 545 to 551 mm per annum, and annual evaporation of 1,466 mm) and soils with limited, water holding capacity due to depth limitations. Crop production is therefore high risk and no longer considered economically viable.

The farm is used only as grazing land for cattle. The land has a long term grazing capacity of 6 hectares per large stock unit.

9 ASSESSMENT OF AGRICULTURAL IMPACT

9.1 Impact identification

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

1. **Loss of agricultural potential by occupation of land** - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use, with consequent potential loss of agricultural productivity and employment for the duration of the project lifetime. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.
2. **Loss of agricultural potential by soil degradation –** This impact only becomes relevant once the land is returned to agricultural land use after decommissioning. Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact only occurs during the construction and decommissioning phases. Due to the low slope of the land and the grass cover, the site has a low susceptibility to soil erosion. In addition, soil degradation control measures, as recommended and included in the EMPr, are likely to be effective in preventing soil degradation.

Two positive agricultural impacts have been identified, that are indirect impacts:

1. **Enhanced agricultural potential through increased financial security for farming operations -** Reliable income will be generated by the farming enterprises through the lease of the land to the energy facility. This is likely to increase their cash flow and financial security and could improve farming operations and productivity through increased investment into farming.
2. **Improved security against stock theft and other crime** due to the presence of security

infrastructure and security personal at the facility.

The extent to which any of these impacts is likely to actually affect levels of agricultural production is small and the significance of agricultural impacts is therefore low.

9.2 The significance of agricultural impact and the factors that determine it

When the agricultural impact of a development is the permanent or long term loss of potential agricultural land, the focus and defining question of the agricultural impact assessment is to determine the importance, from an agricultural production point of view, of that land being conserved for agricultural production rather than being utilised for the development.

The importance is directly proportional to how much production potential the land has on a scale of land capability (which equates to production potential) that is applicable across the country, because the need is to conserve the higher potential land in the country, not the lower potential land. If the land capability is below a certain threshold then it cannot be considered a priority for being conserved as agricultural production land. That threshold is determined by the scarcity of arable crop production land in South Africa and the relative abundance of land that is only good enough to be used for grazing. If land is of sufficient land capability to support viable and sustainable crop production then it is considered to be above the threshold for being prioritised for conservation as agricultural production land and the impact of its loss would be of high significance. If land is not of sufficient land capability to support viable and sustainable crop production, then it is considered to be below the threshold and its loss as agricultural production land is of low significance.

As has been discussed in Section 8, the cropping potential of the site is limited by the combination of a marginal climate and soils with limited, water holding capacity due to depth limitations. The site is therefore assessed as being of insufficient land capability to support viable and sustainable crop production and its loss as agricultural production land is assessed as being of low significance.

It is also important to consider the scale at which the significance of an impact is assessed. An agricultural impact equates to a temporary or permanent change in agricultural production potential of the land. The change in production potential of a farm or significant part of a farm is likely to be highly significant at the scale of that farm, but may be much less so at larger scales. This assessment considers a regional and national scale to be the most appropriate one for assessing the significance of the loss of agricultural production potential. As has been discussed above, the focus of the agricultural component in Environmental Authorisation is to balance the country's need for development against the need to ensure the conservation of land required for agricultural production and national food security.

It should be noted that, in assessing agricultural impact, the exact nature and layout of the different infrastructure within a renewable energy facility has absolutely no bearing on the significance of agricultural impacts. 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.

It is also important to note that the overhead power line will have an insignificant agricultural impact because agriculture is not excluded from the land underneath a power line and agriculture can continue unhindered underneath it. The power line corridor is not therefore considered to be part of the agricultural footprint, and is not defined as part of that footprint in the agricultural protocol.

9.3 Cumulative impacts

The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present or reasonably foreseeable future activities that will affect the same environment. It is important to note that the cumulative impact assessment for a particular project, like what is being done here, is not the same as an assessment of the impact of all surrounding projects. The cumulative assessment for this project is an assessment only of the impacts associated with this project, but seen in the context of all surrounding impacts. It is concerned with this project's contribution to the overall impact, within the context of the overall impact. But it is not simply the overall impact itself.

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

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

DEFF 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 this author, result in an over-focus on methodological compliance, while missing the more important task of effectively answering the above defining question.

DEFF compliance for this project requires considering all renewable energy applications within a 30km radius. There are 3 other renewable energy project applications within 30km of the proposed site. These are listed in Appendix 4 of this report. In addition, there is a second PV project associated with this current development and this has also been included in the consideration of cumulative impact in this report.

All of these projects have the same agricultural impacts in an almost identical agricultural environment, and therefore the same mitigation measures apply to all.

The cumulative impact is affecting an agricultural environment that has been declared a REDZ precisely because it is an environment that can accommodate numerous renewable energy developments without exceeding acceptable levels of agricultural land loss.

In quantifying the cumulative impact, the area of land taken out of agricultural production (grazing) as a result of all 5 developments (total generation capacity of 436 MW) will amount to a total of approximately 1,090 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to only 0.39% of the surface area. That is well within an acceptable limit in terms of loss of grazing land, of which there is no particular scarcity in the country. This is particularly so when considered within the context of the following point.

In order for South Africa to achieve its renewable energy generation goals, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of lower potential agricultural land in a region which has been designated as a REDZ, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country.

It should also 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.

Because the power line component leads to insignificant agricultural land loss, its cumulative impact must also logically be insignificant. It therefore does not make sense to conduct a more

formal assessment of cumulative power line impacts as per DFFE requirements. Many times more power lines than currently exists, or are currently proposed, can be accommodated before acceptable levels of change in terms of agricultural land loss are exceeded. Acceptable levels of change in terms of other types of impact, for example visual impact, would be exceeded long before the levels for agricultural impact became an issue. In reality the landscape in this environment could be covered with power lines and agricultural production would continue, largely unaffected.

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

9.4 Impacts of the no-go alternative

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

The development offers an additional income source to agriculture, but it excludes agriculture from the development's agricultural footprint. Therefore, the negative agricultural impact of the development is more significant than that of the no-go alternative, and so, purely from an agricultural impact perspective, the no-go alternative is the preferred alternative between the development and the no-go. However, the no-go option would prevent the proposed development from contributing to the environmental, social and economic benefits associated with the development of renewable energy in the country.

9.5 Comparative assessment of alternatives

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

Because of the insignificant agricultural impact of the power lines, there can be no material difference between the agricultural impacts of any proposed route alternatives. All have insignificant agricultural impact. All proposed alternatives are considered acceptable in terms of agricultural impact.

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

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, as noted above, the exact positions of all infrastructure within the footprint will not make any material difference to agricultural impacts.

9.7 Confirmation of linear activity impact

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

9.8 Impact footprint

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

The allowable development limit for non-cropland with a land capability value of less than 8, as this site has been confirmed to be in the site sensitivity verification in Section 7 above, is 2.5 ha per MW. The proposed agricultural footprint of the facility is approximately 203 hectares and the generation capacity is 100 MW. This is within the 2.5 ha per MW limit.

9.9 Impact statement

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

Nevertheless, the agricultural impact of this proposed development is assessed here as being of low significance.

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

- The proposed development will occupy land that is of limited land capability and is not suitable for, or currently used for, crop production. There is not a scarcity of such agricultural land in South Africa and its conservation for agricultural production is not therefore a priority.
- The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with lower agricultural production potential.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions
- The proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, improved security, as well as wider, societal benefits.
- The loss of agricultural potential by occupation of land is not permanent. The land will become available again for agricultural production once the proposed activity ceases.
- 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 need to ensure the conservation of land required for agricultural production and national food security.

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

10 ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

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

For the overhead or underground power lines, there are no additional mitigation measures required, over and above what has already been included in the Generic EMPr for overhead electricity transmission and distribution infrastructure as per Government Notice 435, which was published in Government Gazette 42323 on 22 March 2019.

Table 1: Management plan for the planning and design phase

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

Table 2: Management plan for the construction phase

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

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

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

Table 3: Management plan for the operational phase

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

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	**Frequency**	**Responsibility**
		any erosion occurring.	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 denuded areas are re-vegetated to stabilise soil against erosion	Facilitate re-vegetation of denuded areas throughout the site	Undertake a periodic site inspection to record the progress of all areas that require re-vegetation.	Bi-annually	Facility Environmental Manager

Table 4: Management plan for the decommissioning phase

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

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

11 CONCLUSIONS

The entire site was verified in this assessment as being of medium sensitivity for impacts on agricultural resources with a maximum land capability value of 7. Parts of the site are allocated high agricultural sensitivity on the screening tool. However, this was disputed because the land is no longer under crop production and was assessed as being of insufficient land capability for viable and sustainable future crop production. The cropping potential of the site is limited by the combination of a marginal climate and soils with limited, water holding capacity due to depth limitations.

Two potential negative agricultural impacts were identified, loss of agricultural land use, and land degradation. Two positive agricultural impact were identified as enhanced agricultural potential through increased financial security for farming operations, and improved security against stock theft and other crime. These agricultural impacts are likely to have low impact on levels of agricultural production and are therefore assessed as having low significance.

The amount of agricultural land loss caused by the project is within the allowable development limits prescribed by the agricultural protocol to ensure appropriate conservation of agricultural production land and national food security. The site was assessed as being of insufficient land capability to support viable and sustainable future crop production. It is therefore considered to be

below the threshold for being prioritised for conservation as agricultural production land and its loss as agricultural production land is therefore assessed as being of low significance.

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

The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. This is substantiated by the facts that the land is of insufficient land capability for crop production; the amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol; the proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, improved security against crime, as well as wider, societal benefits; the loss of agricultural potential by occupation of land is not permanent; the proposed development is in a REDZ designated for the prioritisation of renewable energy development; and that the proposed development poses a low risk in terms of causing soil degradation.

The proposed development is therefore acceptable and from an agricultural impact point of view, it is recommended that the development be approved.

The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions, other than recommended mitigation.

12 REFERENCES

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

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

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

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

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

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

APPENDIX 1: SPECIALIST CURRICULUM VITAE

Johann Lanz
Curriculum Vitae

Education

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

Professional work experience

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

Soil & Agricultural Consulting **Self employed** **2002 - present**

In the past 5 years of running my soil and agricultural consulting business, I have completed more than 120 agricultural assessments (EIAs, SEAs, EMPRs) in all 9 provinces for renewable energy, mining, urban, and agricultural developments. My regular clients include: Aurecon; CSIR; SiVEST; Arcus; SRK; Environamics; Royal Haskoning DHV; Jeffares & Green; JG Afrika; Juwi; Mainstream; Redcap; G7; Mulilo; and Tiptrans. Recent agricultural clients for soil resource evaluations and mapping include Cederberg Wines; Western Cape Department of Agriculture; Vogelfontein Citrus; De Grendel Estate; Zewenwacht Wine Estate; and Goedgedacht Olives.

In 2018 I completed a ground-breaking case study that measured the agricultural impact of existing wind farms in the Eastern Cape.

Soil Science Consultant **Agricultural 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*.

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

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

PROJECT TITLE

ROAN 2 PV FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR HAARTBEESFONTEIN, NORTH-WEST PROVINCE

Kindly note the following:

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

Departmental Details

Postal address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Private Bag X447, Pretoria, 0001
Physical address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Environment House, 473 Steve Biko Road, Arcadia

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

1. SPECIALIST INFORMATION

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

2. DECLARATION BY THE SPECIALIST

I, **Johann Lanz**, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

Johann Lanz – Soil Scientist (sole proprietor)

Name of Company:

07/02/2022

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

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

Signature of the Specialist

Johann Lanz – Soil Scientist (sole proprietor)

Name of Company

07/02/2022

Date

Signature of the Commissioner of Oaths

2022-02-07

Date

SOUTH AFRICAN POLICE SERVICE
STATION COMMANDER
WYNBERG
2022 -02- 07
STASIEBEVELVOEDER
WYNBERG
SOUTH AFRICAN POLICE SERVICE

APPENDIX 3: SOIL DATA

Table of land type soil data

Land type	Soil series (forms)	Depth (mm)	Clay % A horizon	Clay % B horizon	Depth limiting layer	% of land type
Ba26	Hu	900 - 1100	10 - 20	18 - 30	R,so	35
Ba26	R					15
Ba26	Ms	100 - 200	12 - 18		R,hp	14
Ba26	Rg, Ar	600 - 900	35 - 50		G,R,so	7
Ba26	Av	850 - 950	10 - 20	20 - 30	B2gc	6
Ba26	Gs	200 - 300	10 - 20		R,so	5
Ba26	We	450 - 550	15 - 25	25 - 40	B2gc	4
Ba26	Va, Ss	200 - 250	15 - 20	30 - 40	B2	4
Ba26	Gc	650 - 750	8 - 15	13 - 25	hp	4
Ba26	Hu	900 - 1100	6 - 10	8 - 12	R,so	3
Ba26	Cv	650 - 750	6 - 10	10 - 15	R,so	2
Ba26	Av	850 - 950	25 - 35	35 - 45	B2gc	1
Ba26	Cv	650 - 750	8 - 15	15 - 25	R,so	1
Ba26	Wa	550 - 650	10 - 20		hp	1

Table of soil data from investigated auger samples on site

Sample number	Soil forms	Depth (mm)	Clay % A horizon	Depth limiting layer
1	Hutton	700	15	Hard weathered bedrock
2	Westleigh	300	12	Luvic B horizon (sharp transition to high clay)
3	Avalon	700	12	Luvic plinthic horizon (sharp transition to high clay)
4	Avalon	900	12	Luvic plinthic horizon (sharp transition to high clay)
5	Hutton	600	15	Hard weathered bedrock

APPENDIX 4: PROJECTS INCLUDED IN CUMULATIVE ASSESSMENT

Table of all renewable energy applications within a 30 km radius of the proposed development.

DFFE Reference	Project name	Technology	Capacity (MW)
12/12/20/2513/4	Kabi Vaalkop Photovoltaic Facility	Solar PV	75
12/12/20/2507/2	Witkop Solar PV II facility	Solar PV	61
14/12/16/3/3/2/954	Orkney PV SEF	Solar PV	100
	Roan PV1 Facility	Solar PV	100
	Roan PV2 Facility	Solar PV	100
Total			**436**