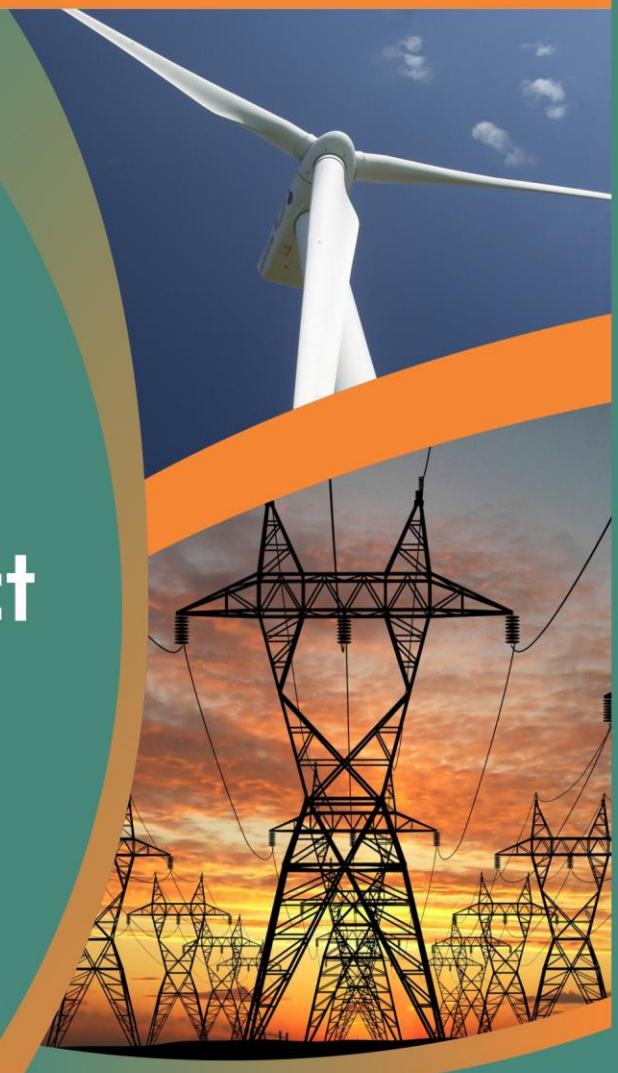
BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Construction and Operation of Electrical Grid Infrastructure to support the Sutherland, Sutherland 2 and Rietrug Wind Energy Facilities (WEFs), Northern and Western Cape Provinces



APPENDIX D.6: Agriculture Impact Assessment

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AGRICULTURAL IMPACT ASSESSMENT FOR DEVELOPMENT OF ELECTRICAL GRID INFRASTRUCTURE NEAR SUTHERLAND IN THE NORTHERN AND WESTERN CAPE PROVINCES

BASIC ASSESSMENT REPORT

Report by
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for
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PO Box 320
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Johann Lanz
Professional profile

Education

• M.Sc. (Environmental Geochemistry)	University of Cape Town	1996 - June 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 am registered as a Professional Natural Scientist (Pri.Sci.Nat.) in the field of soil science, registration number 400268/12, and am a member of the Soil Science Society of South Africa.

- **Soil Science Consultant** **Self employed** **2002 - present**

I run a soil science consulting business, servicing clients in both the environmental and agricultural industries. Typical consulting projects involve:

- Soil specialist study inputs to EIA's, SEA's and EMPR's. These have focused on impact assessments and rehabilitation on agricultural land, rehabilitation and re-vegetation of mining and industrially disturbed and contaminated soils, as well as more general aspects of soil resource management. Recent clients include: CSIR; SRK Consulting; Aurecon; Mainstream Renewable Power; SiVEST; Savannah Environmental; Subsolar; Red Cap Investments; MBB Consulting Engineers; Enviroworks; Sharples Environmental Services; Haw & Inglis; BioTherm Energy; Tiptrans.
- Soil resource evaluations and mapping for agricultural land use planning and management. Recent clients include: Cederberg Wines; Unit for Technical Assistance - Western Cape Department of Agriculture; Wedderwill Estate; Goedgedacht Olives; Zewenwacht Wine Estate, Lourensford Fruit Company; Kaarsten Boerdery; Thelema Mountain Vineyards; Rudera Wines; Flagstone Wines; Solms Delta Wines; Dornier Wines.

- **Soil Science Consultant** **Agricultural Consultors International (Tinie du Preez)** **1998 - end 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 make recommendations on 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*.

Specialist Declaration

I, Johann Lanz, as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I 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;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- 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 have no vested interest in the proposed activity proceeding;
- 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;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study 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: 

Name of company: Johann Lanz – Soil Scientist

Professional Registration (including number): SACNASP Reg. no. 400268/12

Date: 19 June 2019

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EXECUTIVE SUMMARY

The proposed Grid Connection Infrastructure will be located on land zoned and used for agriculture (grazing). South Africa has very limited arable land and it is therefore critical to ensure that development does not lead to an inappropriate loss of land that may be valuable for cultivation. This assessment has found that the proposed development is on land which is of extremely low agricultural potential and is totally unsuitable for cultivation. Furthermore, the agricultural impact of grid infrastructure in this environment is negligible.

The key findings of this study are:

- Soils of the proposed development site are dominated by shallow soils on underlying rock that are of the Mispah and Glenrosa soil forms.
- The major limitation to agriculture is the extremely limited climatic moisture availability.
- As a result of this limitation, the study area is totally unsuitable for cultivation and agricultural land use is limited to low density grazing.
- The proposed development footprint is classified with low land capability evaluation values of between 1 and 7.
- There are no agriculturally sensitive areas and no parts of the site need to be avoided by the development.
- The proposed Grid Connection Infrastructure has negligible impact on agriculture in such an environment because all agricultural activities that are viable in this environment (grazing) can continue completely unhindered underneath transmission lines. Furthermore the actual footprint of disturbance of the infrastructure constitutes only a negligible proportion of the available land surface area.
- The only possible impact of the development was identified as:
  - Very minimal soil and land degradation caused by construction excavation and vehicle passage.
- The impact was assessed as having very low significance after mitigation.
- Cumulative impact is also assessed as very low, predominantly because of the negligible impact of transmission lines on grazing, and the low agricultural potential of the area.
- The recommended mitigation measure is for implementation of an effective system of storm water run-off control, where necessary.
- Due to the low agricultural potential of the site, and the consequent very low, negative agricultural impact, there are no restrictions relating to agriculture which preclude authorisation of the proposed development and therefore, from an agricultural impact point of view, the development should be authorised.
- There are no conditions resulting from this assessment that need to be included in the Environmental Authorisation.
- The overall significance of the impact on agriculture for the construction, operation and decommissioning phase is assessed as very low.

1 INTRODUCTION

1.1 Scope and objectives

This report presents the Soil and Agricultural Impact Assessment undertaken by Johann Lanz (an independent consultant), appointment by the CSIR, as part of the Basic Assessment (BA) Process for the proposed construction and operation of electrical grid infrastructure near Sutherland (see Figure 1).

The objectives of the study are to identify and assess all potential impacts of the proposed development on agricultural resources including soils and agricultural production potential, and to provide recommended mitigation measures, monitoring requirements, and rehabilitation guidelines for all identified potential impacts.

Figure 1: Location of proposed power line and Major Transmission Substation, south east of Sutherland.

1.2 Terms of Reference

The following terms of reference apply to this study:

- Adhere to the requirements of specialist studies in terms of Appendix 6 of the NEMA EIA Regulations (2014), as amended.
- Assess the potential impacts of the proposed development and its associated infrastructure by assessing the impacts during the construction, operational and decommissioning phases.
- Assess Cumulative impacts from other EGI projects located within a 50 km radius of the proposed development.
- Use the Impact Assessment Methodology as provided by the CSIR.
- Propose mitigation measures to address possible negative effects and to enhance positive impacts to increase the benefits derived from the project.
- Assess the project alternatives and the no-go alternative.
- Provide a recommendation as to whether the project must receive Environmental Authorisation or not and Identify any aspects which are conditional to the findings of the assessment which are to be included as conditions of the Environmental Authorisation.

Specific ToR:

- Describe the existing environment in terms of soils, geology, land-use and agricultural potential. Significant soils and agricultural features or disturbances should be identified, as well as sensitive features and receptors within the project area. The description must include surrounding agricultural land uses and activities, to convey the local agricultural context.
- Describe and map soil types (soil forms), soil characteristics (soil depth, soil colour, limiting factors, and clay content of the top and sub soil layers), and degradation and erodibility of soils etc. to the extent necessary to inform this assessment.
- Varying sensitivities of the soils and agricultural potential must be mapped and highlighted.
- The assessment is to be based on existing information, findings of the Wind & Solar PV SEA (CSIR, 2015), and professional experience and field work conducted by the specialist, as considered necessary and in accordance with relevant legislated requirements.
- Identify and assess the potential impacts of the proposed development on soils and agriculture, including impacts of associated infrastructure, such as the buildings, fencing etc.
- Identify any protocols, legal and permit requirements relating to soil and agricultural potential impacts that are relevant to this project and the implications thereof.

- The report needs to fulfil the terms of reference for an agricultural study as set out in the National Department of Agriculture's document, Regulations for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011, with an appropriate level of detail for the agricultural suitability and soil variation on site (which may therefore be less than the standardised level of detail stipulated in the above regulations).

Table 1: Compliance with the Appendix 6 of the 2014 EIA Regulations (as Amended)

Requirements of Appendix 6 – GN R326 EIA Regulations 7 April 2017	**Addressed in the Specialist Report**
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	 Title page CV following Title page
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	 Following CV
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
(ca) an indication of the quality and age of base data used for the specialist report;	Section 2.1
(cb) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 5.4
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	N/A
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 2
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4.7 & Figure 3
g) an identification of any areas to be avoided, including buffers;	Section 4.7
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figure 3; no agricultural environmental sensitivities identified
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2.2
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 5
k) any mitigation measures for inclusion in the EMPr;	Section 8
l) any conditions for inclusion in the environmental authorisation;	Section 9
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 8
n) a reasoned opinion- i. whether the proposed activity, activities or portions thereof should be authorised; (ja) regarding the acceptability of the proposed activity or activities and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	 Section 9 Section 8 Section 8
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Not applicable

2 APPROACH AND METHODOLOGY

The soil investigation applied an appropriate level of detail for the agricultural suitability on site and for the level of impact of the proposed development on agricultural land. A detailed soil survey, as per the requirement in the above DAFF document (see Section

1.2), is only appropriate for a significant footprint of impact on arable land. It has little relevance to an assessment of agricultural potential in this environment, where the agricultural limitations are overwhelmingly climatic, terrain is rugged, soil conditions are generally poor, and cultivation potential is non-existent. In such an environment, even where soils suitable for cultivation may occur, they cannot be cultivated because of the aridity and terrain constraints. Conducting a soil assessment at the stipulated level of detail would be very time consuming and add no value to the assessment. It makes absolutely no sense to conduct a soil survey for the purposes of this assessment. A field investigation was therefore not considered necessary. The assessment was based on a desktop analysis of existing soil and agricultural potential data and other data for the site, which is considered entirely adequate for a thorough assessment of all the agricultural impacts of the proposed development.

The potential impacts identified in this specialist study were assessed based on the criteria and methodology common to the whole impact assessment. The ratings of impacts were based on the specialist's knowledge and experience of the field conditions of the environment in which the proposed development is located, and of the impact of disturbances on that agricultural environment.

2.1 Sources of information

The following sources of information were used:

1. Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries. 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.
2. Land capability data was sourced from the 2017 National land capability evaluation raster data layer produced by the Department of Agriculture, Forestry and Fisheries, Pretoria.
3. Rainfall and temperature data were sourced from The World Bank Climate Change Knowledge Portal, dated 2015.
4. Grazing capacity data was sourced from the 2018 Department of Agriculture, Forestry and Fisheries long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
5. Satellite imagery of the site and surrounds was sourced from Google Earth.
6. The Strategic Environmental Assessment for wind and solar photovoltaic development in South Africa (DEA, 2015) was also consulted in terms of its sensitivity analysis of the area.

2.2 Assumptions and Limitations

The following assumptions were used in this specialist study:

- The study assumes that water for irrigation is not available across the site. This is based on the assumption that a long history of farming experience in an area will result in the exploitation of viable water sources if they exist, and none have been exploited in this area.
- Cumulative impacts are assessed by adding expected impacts from this proposed development to existing and proposed developments with similar impacts in a 50 km radius. The existing and proposed developments that were taken into consideration for cumulative impacts are illustrated in Appendix A.

The following limitation was identified in this study:

- The assessment rating of impacts is not an absolute measure. It is based on the subjective considerations and experience of the specialist, but is done with due regard and as accurately as possible within these constraints.

There are no other specific limitations or knowledge gaps relevant to this study.

3 DESCRIPTION OF PROJECT ASPECTS RELEVANT TO AGRICULTURAL IMPACTS

The project applicant is proposing the development of a 132 kV transmission line, a major transmission substation and 400 kV line within the Renewable Energy Development Zone (REDZ): 2 Komsberg. The 132 kV line routing proposed as part of this application has been previously assessed as part of the proposed construction of the electrical grid infrastructure for the Sutherland Wind Energy Facility (14/12/16/3/3/1/1816), Rietrug Wind Energy Facility (14/12/16/3/3/1/1815) and Sutherland 2 Wind Energy Facility (14/12/16/3/3/1/1814/AM1). These projects received Environmental Authorisation in February 2018. Within the authorisations, the alternative line routing “1” was submitted as the preferred routing and subsequently approved.

The 132 kV line routing proposed as part of this application was considered as alternative line routing “2”. The line routing did not include any environmental fatal flaws and is a technical feasible option to enable the evacuation of the electricity generated by the above mentioned Wind Energy Facilities into the National Grid.

Project components

- Major Transmission Substation (400 m x 400 m)
- Overhead 132 kV line ˜ 41 km (this line has been assessed as part of a previous Basic Assessment Process) and referred to in the reports as “Alternative 2”
- 400 kV ~ 4 km overhead transmission line connecting to an existing Eskom line
- Service roads will be constructed below the lines (jeep track)

4 BASELINE ASSESSMENT OF THE SOILS AND AGRICULTURAL CAPABILITY

This section is organised in sub headings based on the requirements of an agricultural study as detailed in section 1.2 of this report. A satellite image map of the project layout is shown in Figure 3.

4.1 Climate and water availability

The area has a very low average rainfall of between 130 and 210 mm per annum (Schulze, 2009). The average monthly rainfall distribution for the middle of the proposed transmission line is shown in Figure 2. The low rainfall is a very significant agricultural constraint that seriously limits the level of agricultural production (including grazing) which is possible. There are no dams across the project area.

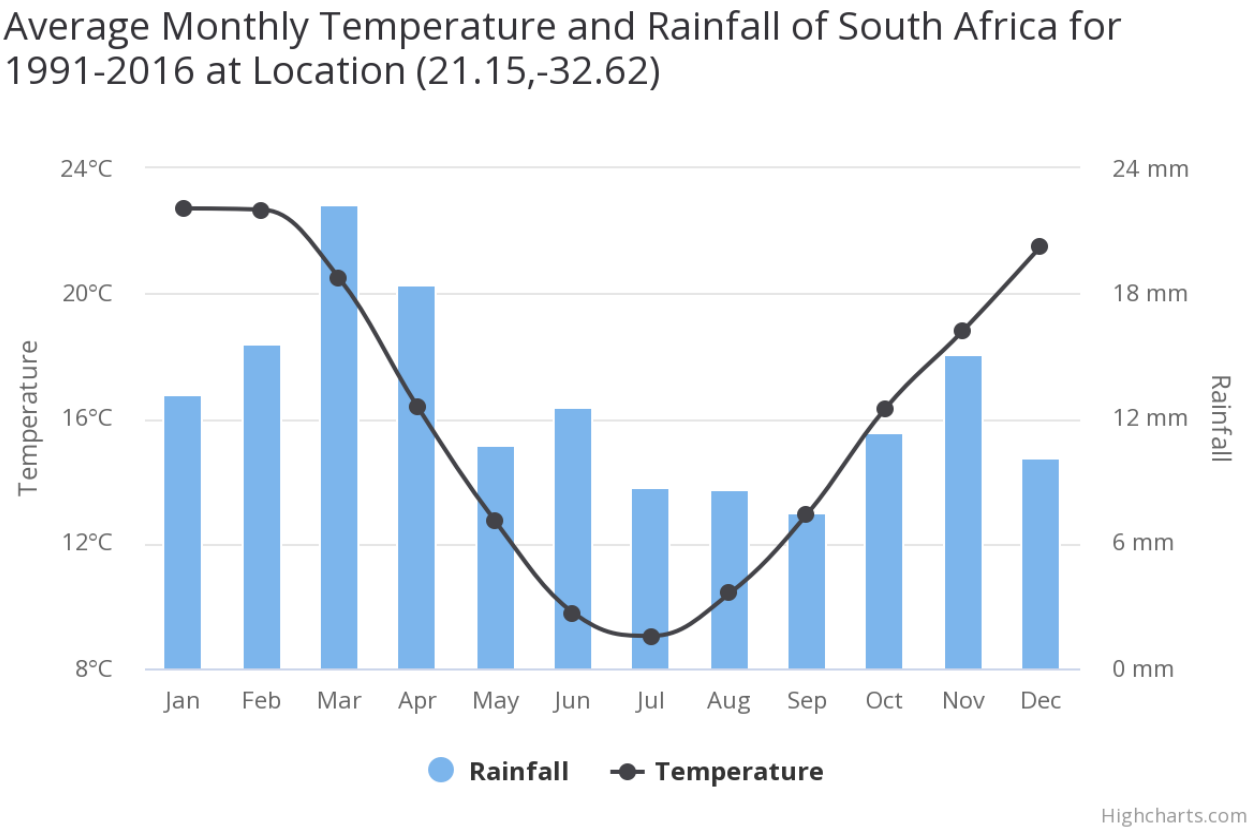

Figure 1: Climate data from the middle of the project area.

Figure 2: Satellite image map of proposed project layout.

4.2 Terrain, topography and drainage

The proposed line runs along the plateau at the edge of the escarpment at an altitude of around 1,600 metres and then drops off the escarpment through very broken terrain to the plains below at an altitude of around 780 metres. There is a wide range of slopes across the broken terrain. There are several non-perennial water courses, typical of arid areas, in the valleys.

The underlying geology of the project area is mudstone, siltstone and sandstone of the Beaufort Group, Karoo Supergroup.

4.3 Soils

The land type classification is a nationwide survey that groups areas of similar soil, terrain and climatic conditions into different land types. The proposed line crosses several very similar Fc and Ib land types that are dominated by rock outcrops and shallow Mispah and Glenrosa soil forms on underlying rock.

4.4 Agricultural capability

Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rainfed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-arable grazing land, or at the lowest extreme, not even suitable for grazing. In 2017 DAFF released updated and refined land capability mapping across the whole of South Africa. This has greatly improved the accuracy of the land capability rating for any particular piece of land anywhere in the country. The new land capability mapping divides land capability into 15 different categories with 1 being the lowest and 15 being the highest. Values of below 8 are generally not suitable for production of cultivated crops. Detail of this land capability scale is shown in Table 2.

The proposed line crosses land classified with land capability evaluation values of 1 – 7. The land capability is limited by the very low climatic moisture availability, the rugged terrain, and the shallow, rocky soils.

Table 2: Details of the 2017 Land Capability classification for South Africa.

Land capability evaluation value	Description
1	Very Low
2	
3	Very Low to Low
4	
5	Low
6	Low to Moderate
7	
8	Moderate
9	Moderate to High
10	
11	High
12	High to Very High
13	
14	Very High
15	

4.5 Land use and development on and surrounding the site

The project is located in a sheep and game farming area and there is no other agricultural activity or infrastructure within the project area.

4.6 Possible land use options for the site

Due to the climate, terrain and soil limitations, the land is considered unsuitable for any agricultural purposes other than low intensity grazing.

4.7 Agricultural sensitivity

Agricultural sensitivity is a direct function of the capability of the land for agricultural production. This is because a negative impact on land of higher agricultural capability is more detrimental to agriculture than the same impact on land of low agricultural capability. A general assessment of agricultural sensitivity, in terms of loss of agricultural land in South Africa, considers arable land that can support viable production of cultivated crops, to have high sensitivity. This is because there is a scarcity of such land in South Africa, in terms of how much is required for food security. However, there is not a scarcity in the country of land that is only suitable as grazing land and such land is therefore not considered to have high agricultural sensitivity.

In terms of the sensitivity categories used in the REDZ sensitivity analysis, this site was assessed as low sensitivity (DEA, 2015).

Agricultural sensitivity of a particular development is also a function of the severity of the impact which that development poses to agriculture. In the case of transmission lines, the impact is negligible (see impact assessment section). This even further reduces the agricultural sensitivity of the study area for the proposed development.

The entire study area has extremely low agricultural potential and therefore very low agricultural sensitivity to development and consequent loss of agricultural land use. Agricultural potential and conditions are also very uniform across the site, and the choice of placement of facility infrastructure therefore has negligible influence on the significance of agricultural impacts. From an agricultural point of view, no parts of the site need to be avoided by the proposed development and no buffers are required.

5 IDENTIFICATION AND ASSESSMENT OF IMPACTS ON AGRICULTURE

The focus and defining question of an agricultural impact assessment is to determine to what extent a proposed development will compromise (negative impacts) or enhance (positive impacts) current and/or future agricultural production. The significance of an impact is therefore a direct function of the degree to which that impact will affect current or future agricultural production. If there will be no impact on production, then there is no agricultural impact. Impacts that degrade the agricultural resource base pose a threat to production and therefore are within the scope of an agricultural impact assessment. Lifestyle impacts on the resident farming community, for example visual impacts, do not necessarily impact agricultural production and, if they do not, are not relevant to and within the scope of an agricultural impact assessment. Such impacts are better addressed within the impact assessments of other disciplines included in the EIA process.

Transmission lines do not really impact the agriculture of the study area because the actual footprint of disturbance is negligible and all agricultural activities that are viable in this environment (grazing) can continue completely unhindered underneath transmission lines. The only possible source of impact from the power line is minimal disturbance to the land during construction and decommissioning.

The substation has a 400 x 400 metre (16 hectare) footprint. While this theoretically will lead to a loss of this land for agriculture, 16 hectares in the context of the agricultural environment of extremely low density grazing on farms which are typically thousands of hectares large is entirely insignificant and therefore does not warrant an assessment.

The following impacts are identified for the different phases of the development and described in table format below.

5.1 Construction phase

5.1.1 Minimal soil and land degradation (erosion and topsoil loss) as a result of land disturbance.

Aspect / Activity	**Construction disturbance and excavation and vehicle passage.**
Type of impact	Direct
Potential Impact	Land surface disturbance including vegetation removal, vehicle passage and excavation may lead to erosion. Because of the slopes, the aridity and the shallow soils, erosion risk is high.
Impact Significance (Pre-mitigation)	Low
Mitigation Required	Implement an effective system of storm water run-off control, where it is required. It would only be required where land disturbance could potentially lead to run-off accumulation that might then lead to down slope erosion. The system should control water movement by means of bunds and ditches, so that it safely disperses and disseminates any run-off accumulation into the veld.
Impact Significance (Post-Mitigation)	Very low

5.2 Operational phase

There is zero impact during the operational phase.

5.3 Decommissioning phase

5.3.1 Minimal soil and land degradation (erosion and topsoil loss) as a result of land disturbance.

Aspect / Activity	**Decommissioning disturbance and excavation and vehicle passage.**
Type of impact	Direct
Potential Impact	Land surface disturbance including vegetation removal, vehicle passage and excavation may lead to erosion. Because of the slopes, the aridity and the shallow soils, erosion risk is high.
Impact Significance (Pre-mitigation)	Low
Mitigation	Implement an effective system of storm water run-off control, where it is

Aspect / Activity	Decommissioning disturbance and excavation and vehicle passage.
Required	required. It would only be required where land disturbance could potentially lead to run-off accumulation that might then lead to down slope erosion. The system should control water movement by means of bunds and ditches, so that it safely disperses and disseminates any run-off accumulation into the veld.
Impact Significance (Post-Mitigation)	Very low

5.4 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 or degradation of agricultural land. The defining question for assessing the cumulative agricultural impact is this:

> *What level of loss of agricultural land use is acceptable in the area, and will the loss associated with the proposed electrical transmission lines cause that level in the area to be exceeded?*

DEA 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 my opinion, result in an over-focus on methodological compliance, while missing the more important task of answering the above defining question more broadly.

The first limitation with DEA's required methodology is that it restricts the cumulative impacts to similar developments, so in this case to renewable energy developments. In order to accurately answer the defining question above, all developments, regardless of their type and similarity, should be taken into account, because all will contribute to exceeding the acceptable level of change.

The second problem with the requirement, is that it restricts surrounding developments to those within an absolutely defined distance, in this case 50 km. Again this does not allow for accurately answering the defining question. To achieve this, the distance used for cumulative impact assessment should be discipline dependent. A different distance is likely to apply for agricultural impact than for economic impact or botanical impact. And a different distance should be used in different environments, for example in high potential agricultural environments versus very low potential agricultural environments.

Given the above, this assessment focuses more on effectively addressing the defining question above than getting distracted by methodological compliance for its own sake. It does this by considering cumulative impacts more broadly. This includes considering a wider area than the 50 km radius, and considering the likelihood of pressure from other types of developments as well.

There are 9 renewable energy projects, with their associated transmission lines, within 50 km of the proposed site (that need to be considered in terms of the DEA requirements). These are mapped in Appendix A.

All of these projects have the same agricultural impacts in a very similar agricultural environment. The cumulative impact is likely to be well within an acceptable limit in terms of loss of low potential agricultural land, of which there is no scarcity in the country. This is particularly so when considered within the context of the following point:

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

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 low.

Due to all of the considerations discussed above, the cumulative impact of loss of agricultural land use is assessed as having low significance. In terms of cumulative impact, therefore, the development can be authorised.

Aspect / Activity	Occupation of and impact to the land by the project infrastructure of multiple developments
Type of impact	Direct
Potential Impact	Cumulative impacts are likely to occur as a result of the regional impact on agricultural land because of other developments on agricultural land in the region. Because the land is of such low agricultural potential, the cumulative loss of agricultural resources is of very low significance.
Status	Negative
Impact Significance (Pre-mitigation)	Very low
Mitigation Required	There is no additional mitigation required for cumulative impacts, other than what has already been recommended for the project above.
Impact Significance (Post-Mitigation)	Very low

6 IMPACT ASSESSMENT TABLES

The fact that the footprint of disturbance affects such a small proportion of the surface area influences the assessment of probability of an impact. If an impact such as erosion is likely to occur in only a few isolated spots within the larger project area, then its probability of occurring is assessed in the tables as lower, because the probability of it impacting a significant area is low.

Table 3: Impact assessment summary table

Impact pathway	Nature of potential impact/risk	Mitigation	Status	Extent	Duration	Consequence	Probability	Reversibility of impact	Irreplaceability of receiving environment/ resource	Significance of impact/risk = consequence x probability	Can impact be avoided?	Can impact be managed or mitigated?	Potential mitigation measures	Ranking of impact/ risk	Confidence level
	SOIL AND AGRICULTURE														
	CONSTRUCTION PHASE														
	Direct impacts														
Land disturbance	Soil erosion and degradation	Without mitigation	Negative	Site	Medium term	Moderate	Very unlikely	Moderate	Low	Low	No	Yes	Implement an effective system of storm water run-off control.	5	High
		With mitigation	Negative	Site	Medium term	Slight	Extremely unlikely	Moderate	Low	Very low					
	DECOMMISSIONING PHASE														
	Direct impacts														
Land disturbance	Soil erosion and degradation	Without mitigation	Negative	Site	Medium term	Moderate	Very unlikely	Moderate	Low	Low	No	Yes	Maintain an effective system of storm water run-off control.	5	High
		With mitigation	Negative	Site	Medium term	Slight	Extremely unlikely	Moderate	Low	Very low					

Table 4: Impact assessment summary table - Cumulative impacts

Impact pathway	Nature of potential impact/risk	Mitigation	Status	Extent	Duration	Consequence	Probability	Reversibility of impact	Irreplaceability of receiving environment/ resource	Significance of impact/risk = consequence x probability	Can impact be avoided?	Can impact be managed or mitigated?	Potential mitigation measures	Ranking of impact/ risk	Confidence level
	SOIL AND AGRICULTURE														
	CUMULATIVE IMPACTS														
	Direct impacts														
Occupation of and disturbance to agricultural land	Loss of agricultural land	Without mitigation	Negative	Regional	Long term	Slight	Very unlikely	Moderate	Low	Very low	No	No		5	High

7 LEGISLATIVE AND PERMIT REQUIREMENTS

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 if the following two conditions apply:

1. if the servitude width exceeds 15 metres; and
2. if Eskom is not the applicant for the servitude.

If one or both of these conditions do not apply, then no agricultural consent is required. Eskom is currently exempt from agricultural consent for power line servitudes.

Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA). No application is required in terms of CARA. The EIA process covers the required aspects of this.

8 ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

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

Table 5: Management plan for the planning and design phase

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

Table 6: Management plan for the construction phase

Impact	Mitigation / management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and it must prevent any potential down slope erosion.	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	Monthly	Environmental Control Officer (ECO)

Table 7: 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 any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	Bi-annually	Facility Environmental Manager

Table 8: 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.	Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring.	Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	Monthly	Environmental Control Officer (ECO)

9 CONCLUSIONS

The proposed development is on land of limited agricultural potential that is only viable for grazing. Transmission lines do not really impact the agriculture of the study area because all agricultural activities that are viable in this environment (grazing) can continue completely unhindered underneath transmission lines. The small size of the substation within the agricultural context means that the loss of the substation footprint is entirely insignificant as an agricultural impact. The only possible source of impact is minimal disturbance to the land resulting in minimal degradation during construction and decommissioning. All potential agricultural impacts including cumulative impacts are assessed as very low.

There are no agriculturally sensitive areas that need to be avoided by the development.

Due to the low agricultural potential of the site, and the important fact that transmission lines have such little impact on agriculture, as well as the minimal impact of the substation in this agricultural environment, the impact of the development is assessed as very low. There are therefore no restrictions relating to agriculture which preclude authorisation of the proposed development and therefore, from an agricultural impact point of view, the development should be authorised.

There are no conditions resulting from this assessment that need to be included in the Environmental Authorisation.

10 REFERENCES

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11 APPENDIX A

Map of Renewable Energy Projects considered for the cumulative impact assessment.