



SCOPING PHASE REPORT

SOIL, LAND USE, LAND CAPABILITY AND AGRICULTURAL POTENTIAL SURVEY:

PROPOSED ABERDEEN 200 MW WIND ENERGY FACILITY IN THE EASTERN CAPE PROVINCE

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DECLARATION

I, Johan Hilgard van der Waals, declare that I –

- 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 71 and is punishable in terms of Section 24F of the Act.

J.H. VAN DER WAALS
TERRA SOIL SCIENCE

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SCOPING PHASE SOIL, LAND USE, LAND CAPABILITY AND AGRICULTURAL POTENTIAL SURVEY – PROPOSED ABERDEEN 200 MW WIND ENERGY FACILITY IN THE EASTERN CAPE PROVINCE

1. TERMS OF REFERENCE

Terra Soil Science (TSS) was commissioned by Savannah Environmental (Pty) Ltd to undertake a scoping level soil, land use, land capability and agricultural potential survey for the proposed Aberdeen 200 MW Wind Energy Facility in the Eastern Cape Province.

2. INTRODUCTION

A scoping level soil, land use, land capability and agricultural potential survey was conducted for the proposed Aberdeen 200 MW Wind Energy Facility near Aberdeen in the Eastern Cape Province.

3. DESCRIPTION OF THE SURVEY AREA

3.1 Survey Area Boundary

The survey area lies between 32° 24' 51" and 32° 30' 49" south and 23° 40' 09" and 23° 48' 54" east, 55 km west of the town of Aberdeen in the Eastern Cape Province (**Figure 1**).

3.2 Survey Area Physical Features

The survey area lies on relatively flat terrain that slopes down in a south-westerly direction with the altitude varying between 840 and 940 m above mean sea level. The geology is dominated by mudstone, siltstone and sandstone with alluvium.

4. SOIL, LAND CAPABILITY, LAND USE SURVEY AND AGRICULTURAL POTENTIAL SURVEY

4.1 Method of Soil, Land Capability, Land Use Survey and Agricultural Potential Survey

The scoping soil, land capability, land use and agricultural potential surveys were conducted in two phases.

4.1.1 Phase 1: Land Type Data

Land type data for the site was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC). The land type data is presented at a scale of 1:250 000 and entails the division of land into land types, typical terrain cross sections for the land

type and the presentation of dominant soil types for each of the identified terrain units (in the cross section). The soil data is classified according to the Binomial System (MacVicar et al., 1977). The soil data was interpreted and re-classified according to the Taxonomic System (MacVicar, C.N. et al. 1991).

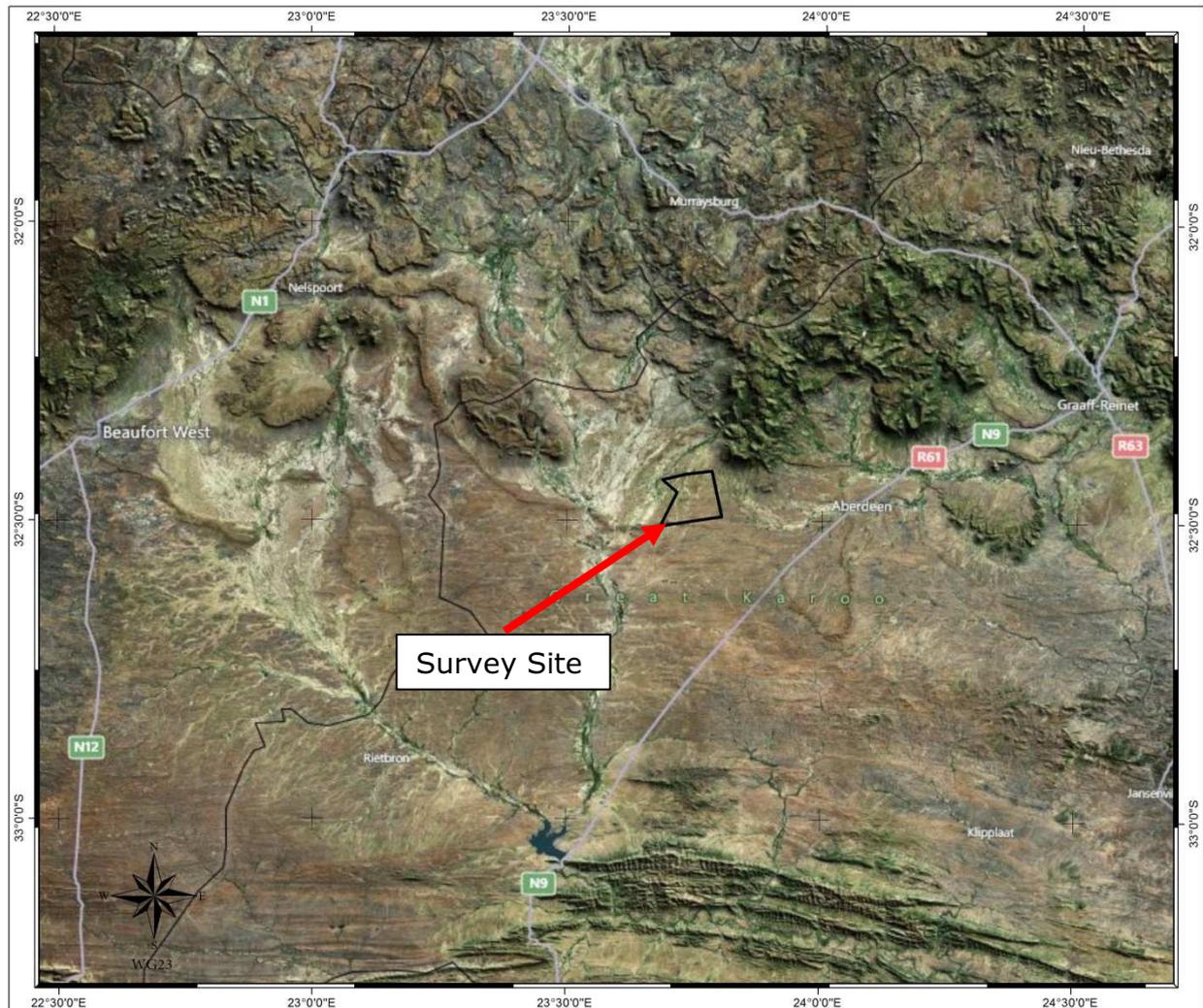


Figure 1 Locality of the survey site

4.1.2 Phase 2: Aerial Photograph Interpretation and Land Use Mapping

The most up to date aerial photographs of the site were obtained from Google Earth. The image was used to interpret aspects such as land use and land cover as well as historic land uses such as cultivation.

Land Type Ag9

Soils: Mainly shallow soils and rock outcrops with occasional occurrences of deep eutrophic and lime containing red soils. Variable depth soils with signs of incipient pedogenesis occur in drainage depressions.

Land capability and land use: Exclusively extensive grazing due to climatic and soil constraints.

Agricultural potential: Very low potential due to the low rainfall (less than 200 mm per year – **Figure 3**) and shallow soils.

Land Type Ia43

Soils: Variable depth eutrophic and lime containing soils with signs of incipient soil formation. Structured / duplex soils occur occasionally.

Land capability and land use: Exclusively extensive grazing due to climatic and soil constraints.

Agricultural potential: Very low potential due to the low rainfall (less than 200 mm per year – **Figure 3**) and shallow soils.

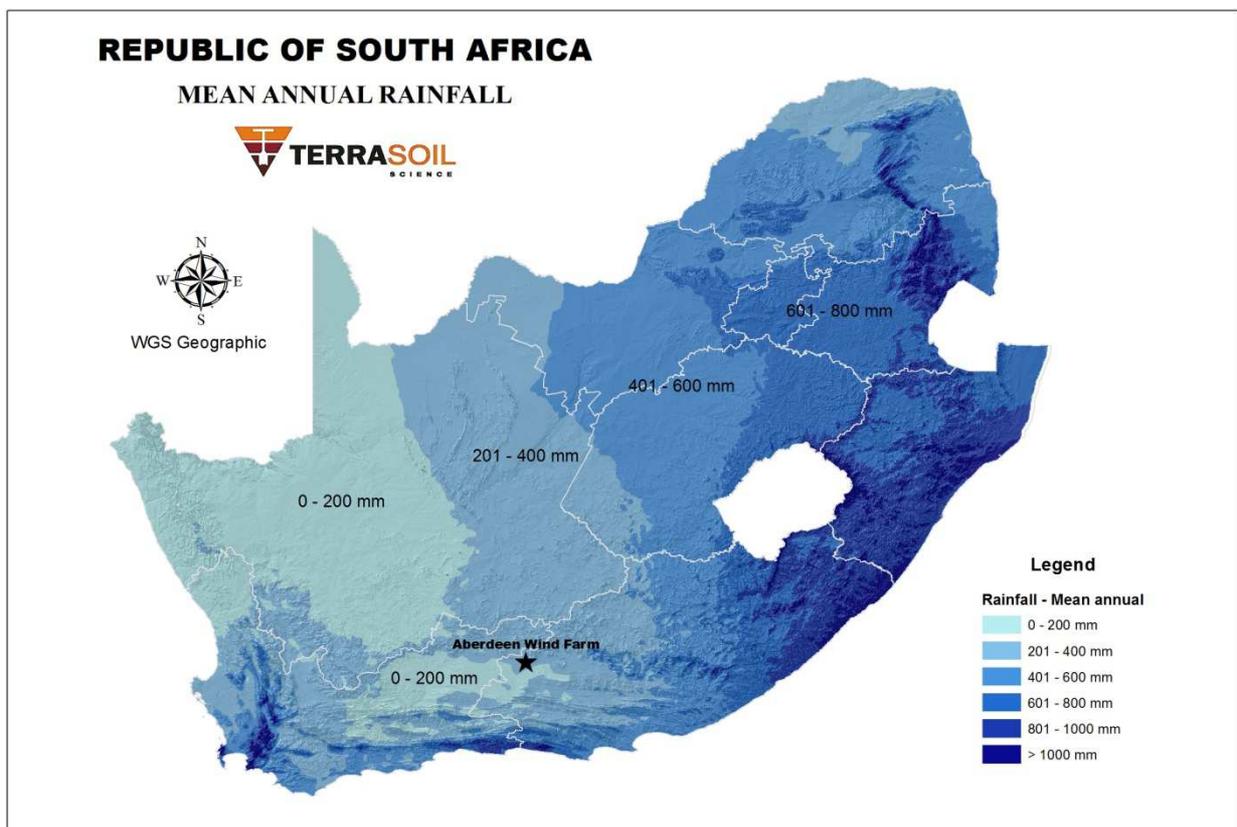


Figure 3 Rainfall map of South Africa indicating the survey site

4.2.2 Phase 2: Aerial Photograph Interpretation and Land Use/Capability Mapping

The interpretation of the Google Earth image yielded one dominant land use, namely extensive grazing (**Figure 4**). The land capability of the site can be considered to be "wilderness" as the grazing capacity is low enough that only natural land uses and low intensity grazing make sense.

5. INTERPRETATION OF SOIL, LAND CAPABILITY AND LAND USE SURVEY RESULTS

The interpretation of the land use and land capability results yielded a number of aspects that are of importance to the project.

5.1 Agricultural Potential

The agricultural potential of the site is very low and limited to extensive grazing due to the low rainfall and distinct soil constraints. There is only little potential to increase the agricultural potential in the form of irrigation development as the soils are generally shallow or not suited to irrigated agriculture due to inherent soil constraints. The potential for irrigation will have to be ascertained through detailed soil investigations. Water availability, however, is the main restricting factor and as such this type of land use is not considered viable for the site.



Figure 4 Land use on the survey site

5.2 Overall Soil Impacts

The overall impacts of the proposed wind energy facility will be low due to the low agricultural potential of the site. Due to the low rainfall, impacts on the soils such as erosion and dust generation are considered potentially problematic and will have to be addressed in more detail during the EIA phase. At present there are no preferences for the placement of the turbines as the impacts are considered to be similar throughout the site. This situation can change once the detailed investigation has been conducted.

6. ANTICIPATED SOIL / LAND USE / AGRICULTURE IMPACTS

The following impacts are expected for the proposed development:

6.1 Physical Soil Disturbance Due To Construction Activities

Nature of Impact: Direct impacts are associated with the soils along the constructed roads as well as on the PV panel construction sites. Indirect impacts could arise in the form of soil erosion and degradation if storm water management is not planned and managed properly as it is generated on the roads and construction sites. Cumulative impacts are only considered to be problematic if the aforementioned storm water management is not instituted. Otherwise very limited cumulative impacts are expected due to the shallow nature of the soils.

Extent of Impact: The extent of this impact will be local in terms of the activity and will be associated with the activity only. Slightly larger, but still local in extent, impacts are expected if storm water runoff is not controlled.

Potential Significance of Identified Impacts: The potential significance of the identified impacts is low due to the widespread occurrence of soil degradation on the site related to arid conditions, low plant cover and intensive (but scarce) rainfall events.

Potentially Significant Impacts to be Assessed in EIA Phase: The potentially significant impacts to be assessed in the EIA phase will be limited to the classification of the soils as well as assessment of slopes and storm water impacts. These parameters will provide an indication to the project engineers regarding the erosion risk as well as inform the mitigation measures to be implemented on the site.

6.2 Impacts on Current Land Use Due To Construction Activities

The current land use is limited to extensive grazing.

Nature of Impact: Direct impacts are associated with the constructed roads as well as the PV panel construction sites. Indirect impacts could arise in the form of land use changes due to soil erosion and degradation if storm water management is not planned and managed properly as it is generated on the roads and construction sites. Cumulative impacts are only considered to be problematic if the aforementioned storm water management is not instituted. Otherwise very limited cumulative impacts are expected due to the low intensity land uses practiced on the site.

Extent of Impact: The extent of this impact will be local in terms of the activity and will be associated with the activity only. Slightly larger, but still local in extent, impacts are expected if storm water runoff is not controlled.

Potential Significance of Identified Impacts: The potential significance of the identified impacts is low due to the widespread occurrence of natural soil degradation on the site related to arid conditions, low plant cover and intensive (but scarce) rainfall events.

Potentially Significant Impacts to be Assessed in EIA Phase: The potentially significant impacts to be assessed in the EIA phase will be limited to the determination of, in a broad sense, the carrying capacity of the site in general and specific sections of the site.

6.3 Impacts on Agricultural Potential Due To Construction Activities

The agriculture potential of the site is low due to a range of biophysical constraints.

Nature of Impact: Direct impacts are considered to be small due to the low agricultural potential. Significant indirect and/or cumulative impacts are considered to be improbable due to the low potential on the entire site.

Extent of Impact: The extent of this impact will be local in terms of the activity and will be associated with the activity only. Slightly larger, but still local in extent, impacts are expected if storm water runoff is not controlled. The impacts are considered to be low due to the low agricultural baseline of the site.

Potential Significance of Identified Impacts: The potential significance of the identified impacts is low due to the widespread occurrence of natural soil degradation on the site related to arid conditions, low plant cover and intensive (but scarce) rainfall events.

Potentially Significant Impacts to be Assessed in EIA Phase: The potentially significant impacts to be assessed in the EIA phase will be limited to the determination of the agricultural potential of the soils as well as the probability that they will be impacted.

7. CONCLUSIONS AND RECOMMENDATIONS

It is concluded that the proposed development of a solar energy facility on the site will not have large impacts on the current land use of the broader area. This is mainly due to the low agricultural potential, dominant soils and climatic constraints for the site. Long-term detrimental impacts are not expected but adequate mitigation and management measures have to be put in place. The main aspects that will have to be managed on the site include erosion and dust generation during the construction process.

The impacts on the site need to be viewed in relation to the opencast mining of coal in areas of high potential soils – such as the Eastern Highveld. With this comparison in mind the impact of a wind energy facility is negligible compared to the damaging impacts of coal mining – for a similar energy output. Therefore, in perspective, the impacts of the proposed facility can be motivated as necessary in decreasing the impacts in areas where agriculture potential plays a more significant role.

A detailed site visit will have to be conducted as part of the EIA level investigation and the following parameters should be investigated:

- » Soil distribution (classification) on the site;
- » Extent of degradation due to current land use (such as overgrazing);
- » Erosion status and erodibility of the soils on the site; and
- » Mitigation measures to arrest current impacts and manage future impacts associated with the development.

8. LIMITATIONS / GAPS IN KNOWLEDGE

The following limitations, or gaps in knowledge, exist for the proposed activity on the site

- » Soil distribution (classification) on the site (to be generated during the EIA phase);
- » Extent of degradation due to current land use (to be generated during the EIA phase);
- » Erosion status and erodibility of the soils on the site (to be generated during the EIA phase); and
- » Design specifications and layout of proposed development. This detail will guide the specific impacts to be assessed as well as the proposed mitigation measures.

The above mentioned aspects will form part of the plan of study and will be addressed during the EIA phase survey.

REFERENCES

LAND TYPE SURVEY STAFF. (1972 – 2006). *Land Types of South Africa: Digital map (1:250 000 scale) and soil inventory databases*. ARC-Institute for Soil, Climate and Water, Pretoria.

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