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SOIL. AGRICULTURE. ENVIRONMENT.

Agricultural Compliance Statement for the proposed Kudu Wind Energy Facility

Submitted by TerraAfrica Consult cc

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21 September 2023

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1. Introduction

TerraAfrica Consult cc was appointed by Savannah Environmental (Pty) Ltd to conduct the Agricultural Compliance Statement as part of the Basic Assessment (BAR) process for the Kudu Wind Facility (from here onwards referred to as Kudu WEF). The project applicant is FE Kudu (Pty) Ltd.

FE Kudu (Pty) Ltd is proposing the development of a wind energy facility and associated infrastructure on a site located approximately 40km west of Aberdeen in the Eastern Cape Province. The project is located within the Dr Beyers Naude Local Municipality and the greater Sarah Baartman District Municipality. The project site comprises a single affected property, Portion 2 of Farm Oorlogspoort 85. The project is known as the FE Kudu Wind Energy Facility. The project is planned as part of a cluster of renewable energy projects, which includes a second facility, FE Tango Wind Energy Facility, located approximately 20km to the east of the site.

The entire extent of the site falls within the Beaufort West Renewable Energy Development Zones (i.e. REDZ Focus Area 11). The undertaking of a basic assessment process for the project is in-line with the requirements stated in GNR 114 of 16 February 2018.

The Kudu Wind Energy Facility will have a contracted capacity of up to 600MW and comprise wind turbines with a capacity of up to 7.5MW each. The project has a preferred project site of approximately ~9 170ha. Access to the site will be via an existing road off of the nearby R61. The FE Kudu Wind Energy Facility project site is proposed to accommodate the following infrastructure:

- Up to 80 wind turbines, turbine foundations and turbine hardstands
  - An on-site substation hub incorporating:
    - A132kV on-site facility substation
    - Switchyard with collector infrastructure
    - Battery Energy Storage System (BESS)
    - Operation and Maintenance buildings
  - A balance of plant area incorporating:
    - Temporary laydown areas
    - A construction camp laydown and temporary concrete batching plant
  - Power lines internal to the wind farm, trenched and located adjacent to internal access roads, where feasible[1].
  - Access roads to the site and between project components with a width up to 8m for primary access routes.

A technically viable development footprint was proposed by the developer and assessed as part of the studies.

[1] The intention is for internal project cabling to follow the internal roads.

The project is intended to provide electricity to the national grid through the Department of Mineral Resource and Energy's (DMRE) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme or other public or private off-taker programmes.

2. Details of specialist

Mariné is a scientist registered with the South African Council for Natural Scientific Professions (SACNASP) and is specialised in the fields of Agricultural Science and Soil Science. Her SACNASP Registration Number is 400274/10. Mariné holds a BSc. degree in Agricultural Science (with specialisation in Plant Production) from the University of Pretoria and a MSc. Degree in Environmental Science from the University of the Witwatersrand. She has consulted in the subject fields of soil, agriculture, pollution assessment and land use planning for the environmental sector of several African countries including Botswana, Mozambique, Democratic Republic of Congo, Liberia, Ghana and Angola. She has also consulted on the soil and agricultural assessment of a gas infrastructure project in Afghanistan. Mariné's project experience conducting assessments for renewable energy projects include solar and wind energy facilities in the Western, Northern and Eastern Cape as well as the North West, Free State and KwaZulu Natal Provinces. Her contact details are provided in Appendices 1 and 2 attached.

Jan-Dirk is a candidate scientist registered with the South African Council for Natural Scientific Professions (SACNASP) and is specialized in the field of Soil Science. His SACNASP registration number is 400274/13. Jan-Dirk holds a BSc. Degree in Agricultural Science (with specialization in Soil Science) from the University of the Free State and a MSc. Degree in Soil Science from the University of the Free State.

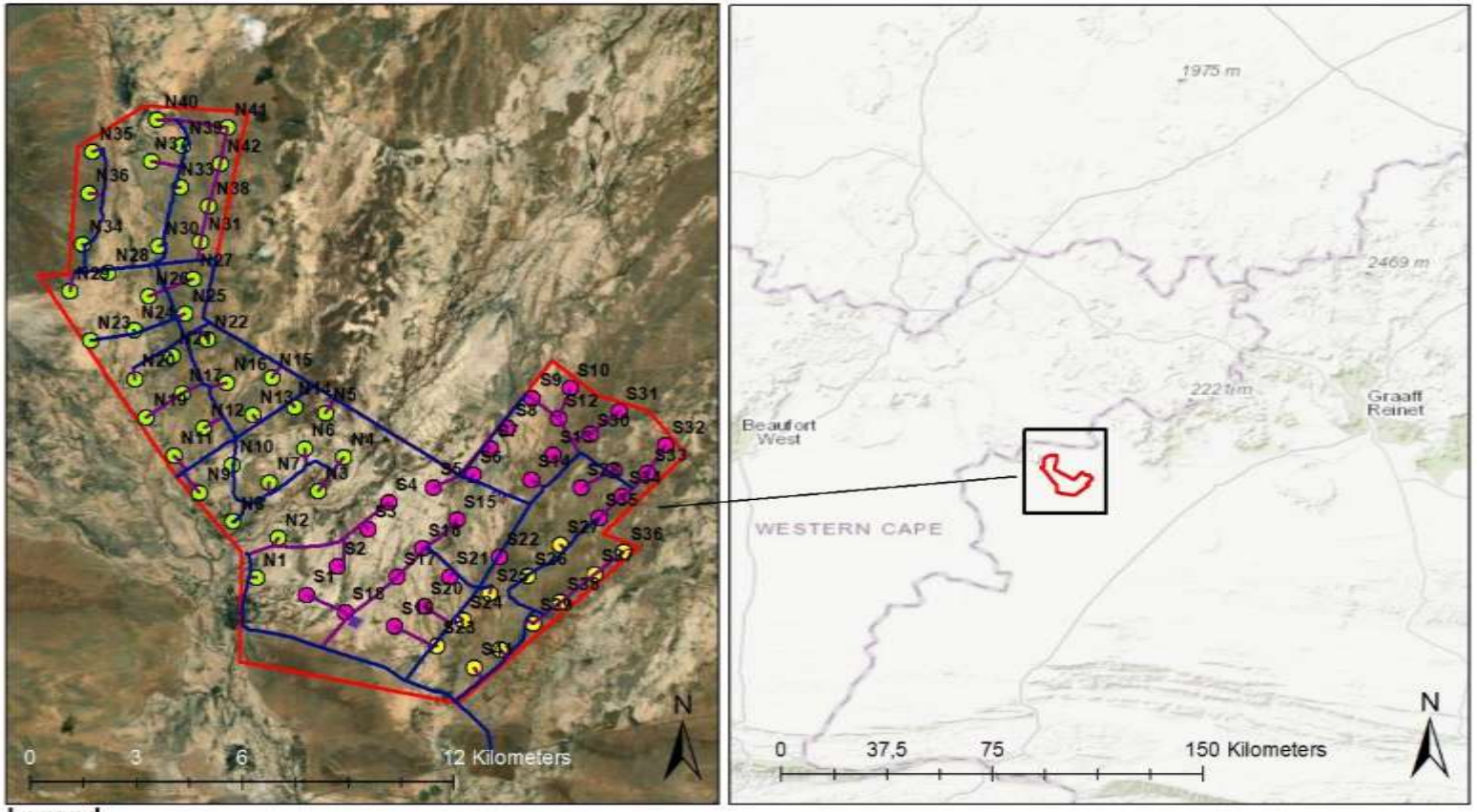


Figure 1: Locality map of the development area of the proposed Kudu Wind Energy Facility.

3. Purpose and objectives of the Agricultural Compliance Statement

The overarching purpose of the Agricultural Compliance Statement that will be included in the Basic Assessment Report, is to ensure that the sensitivity of the site from the perspective of agricultural production to the proposed project activities, is sufficiently considered. Also, that the information provided in this report, enables the Competent Authority to come to a sound conclusion on the impact of the proposed project on the agricultural production potential of the development area.

To meet this objective, site sensitivity verification must be conducted of which the results must meet the following objectives:

- It must confirm or dispute the current land use and the environmental sensitivity as was indicated by the National Environmental Screening Tool.
- It must contain proof in the form of photographs of the current land use and environmental sensitivity pertaining to the study field.
- All data and conclusions are submitted together with the Basic Assessment Report (prepared in accordance with the NEMA regulations) for the proposed Kudu Wind Energy Facility.

According to GN320, the Agricultural Compliance Statement that is submitted must meet the following requirements:

- It must be applicable to the preferred site and the proposed development footprint.
- It has to confirm that the site is of “low” or “medium” sensitivity for agriculture.
- It has to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site.

The following checklist is supplied as per the requirements of GNR 320, detailing where in the report the various requirements have been addressed:

GNR 320 requirements of an Agricultural Compliance Statement (Low to Medium Sensitivity)	**Reference in this report**
3.1. The Agricultural Compliance Statement must be prepared by a soil scientist or agricultural specialist registered with the SACNASP.	Page 2, Appendix 1, and 2
3.2. The Agricultural Compliance Statement must: 3.2.1. be applicable to the preferred site and proposed development footprint;	Page 4 and 7
3.2.2. confirm that the site is of "low" or "medium" sensitivity for agriculture; and	Section 9.3
3.2.3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site.	Section 12
3.3. The Agricultural Compliance Statement must contain, as a minimum, the following information: 3.3.1. contact details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the assessment including a curriculum vitae;	Page 2 Appendix 1, and 2
3.3.2. a signed statement of independence;	Appendix 1
3.3.3. a map showing the proposed development footprint (including supporting infrastructure) with a 50m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool;	Figure 2
3.3.4. confirmation from the specialist that all reasonable measures have been taken through micro- siting to avoid or minimise fragmentation and disturbance of agricultural activities;	Section 12
3.3.5. a substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not, of the proposed development;	Section 12
3.3.6. any conditions to which the statement is subjected;	Section 10
3.3.7. 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;	N/A – not a linear activity
3.3.8. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr; and	Section 10
3.3.9. a description of the assumptions made as well as any uncertainties or gaps in knowledge or data.	Section 7
3.4. A signed copy of the Agricultural Compliance Statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	This report forms part of the BA process reports for authorisation

4. Terms of Reference

In addition to the requirements stipulated in GN320, the following Terms of Reference as stipulated by Savannah Environmental (Pty) Ltd applies to the Agricultural Compliance Statement:

- To ensure that the soil properties of the site are characterized and that the current status of soil quality of the development area, is described. This includes a description of any existing soil degradation issues and recommendations on whether the project will result in high-risk impacts on soil quality.
- Identify and assess potential impacts on both agricultural potential as well as soil, resulting from the proposed Kudu WEF.
- Identify and describe potential cumulative soil, agricultural potential and land capability impacts resulting from the proposed development in relation to proposed and existing developments in the surrounding area.
- Recommend mitigation, management, and monitoring measures to minimise impacts and/or optimise benefits associated with the proposed project.

5. Agricultural Sensitivity

The combined Agricultural Sensitivity of the Kudu Wind Energy Facility development area was determined by using the National Environmental Screening Tool (www.screening.environment.gov.za). The Agricultural Theme of the screening tool considers a combination of the national land capability raster data as well as the field crop boundaries as compiled by Department of Agricultural, Forestry and Fisheries (DALRRD) (DALRRD 2017, DALRRD 2019).

The screening report was generated by Savannah Environmental (Pty) Ltd for the proposed development area (Refer to Figure 2). According to the agricultural sensitivity, the development area consists predominantly of land with Medium sensitivity. One small area shows a High agricultural sensitivity and are allocated to old fields and soils with a land capability ranging from Very low (Class 01) to Moderate (Class 08). Medium sensitive areas are allocated to areas with Low-Moderate (Class 06 & 07) and Moderate (Class 08) land capability. Low sensitivity is found in the far south corner of the development area and are allocated to areas with a land capability of Very low (Class 01) to Low (Class 05).

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

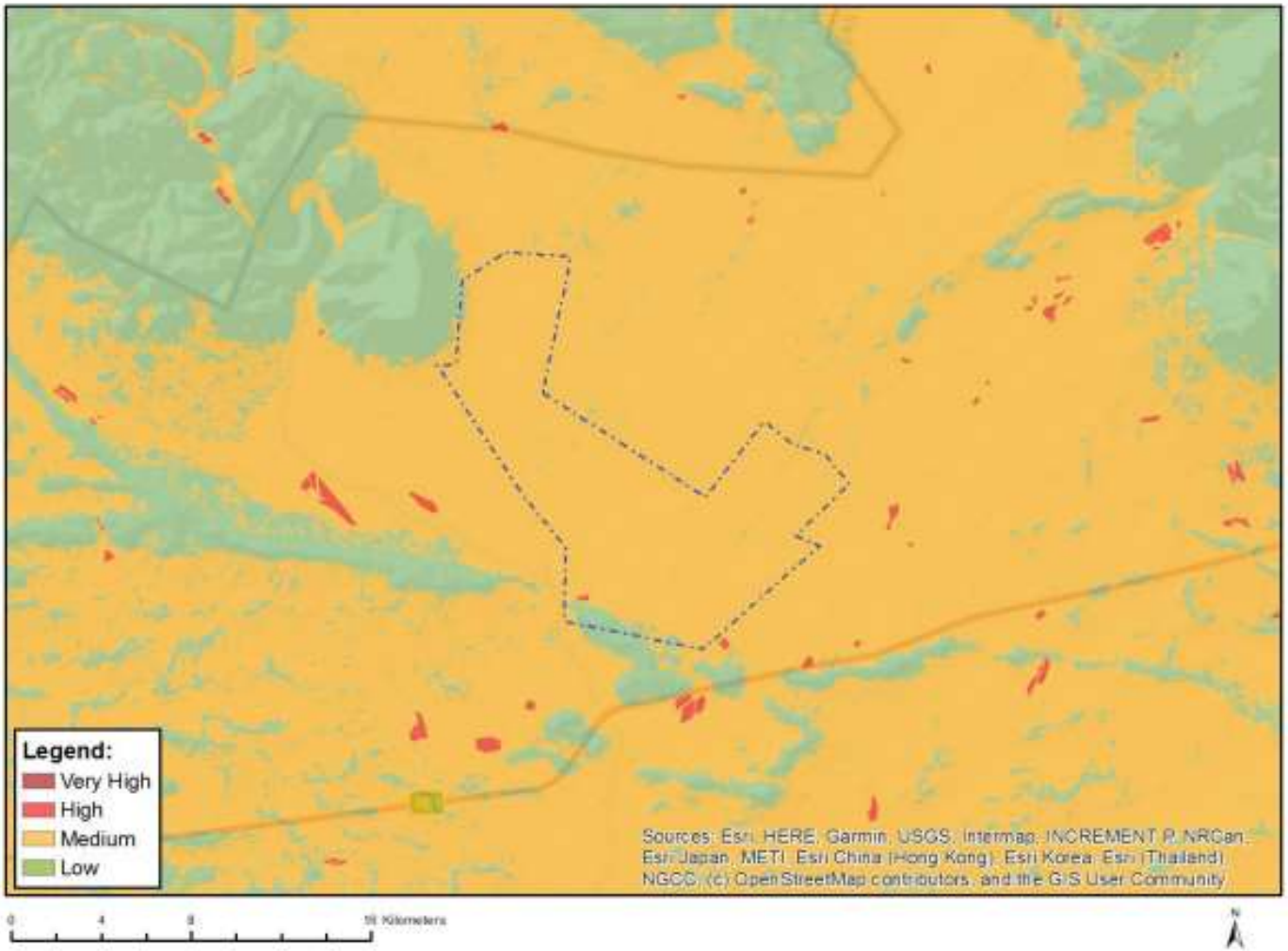


Figure 2: Agricultural Combined Sensitivity of the development area and surrounding area, generated from the Environmental Screening Tool (DFFE, 2023).

6. Environmental legislation and soil management guidelines applicable to study

The report follows the protocols as stipulated for Agricultural Compliance Statement in Government Notice 320 of 2020 (GN320). This Notice provides the procedures and minimum criteria for reporting in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (No. 107 of 1998) (from here onwards referred to as NEMA). It replaces the previous requirements of Appendix 6 of the Environmental Impact Assessment Regulations of NEMA.

Since the results of the environmental screening report indicated that the development area has Medium to Low sensitivity with regards to the combined agricultural theme, an Agricultural Compliance Statement is required as part of the Basic Assessment process. This was confirmed by the desktop assessment of available data and aerial imagery as well as the findings of the site verification visit. In addition to the specific requirements of GN320 for this study, the following South African legislation is also considered applicable to the interpretation of the data and conclusions made with regards to environmental sensitivity and the conservation of soil resources of the project area:

- The Conservation of Agricultural Resources (Act 43 of 1983) states that the degradation of the agricultural potential of soil is illegal. This Act requires the protection of land against soil erosion and the prevention of water logging and salinisation of soils by means of suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges and watercourses are also addressed.
- Section 3 of the Subdivision of Agricultural Land Act 70 of 1970 may also be relevant to the development since dominant land use of the land portion will change from agriculture to energy generation.
- In addition to this, the National Water Act (Act 36 of 1998) deals with the protection of water resources (i.e. wetlands and rivers) and may be relevant if wetland areas are identified within the development area.

7. Methodology

The different steps that were followed to gather the information used for the compilation of this report, is outlined below. The methodology is in alignment with the requirements of GN320.

7.1 Desktop analysis of satellite imagery

The most recent aerial photography of the area available from Google Earth was obtained and used together with the contours of the area, to identify different landscape features and terrain units in preparation of the site visit. The satellite imagery was also scanned for any areas where crop production and farming infrastructure may be present. The results of this analysis were used to pre-determine sampling and observation points and the coordinates of these points were transferred to the GPS for the site assessment.

7.2 Analysis of all other relevant available information

To ensure a comprehensive analysis of the proposed development area, the following data was also analysed:

- The National Land Capability Evaluation Raster Data Layer was obtained from the DALRRD to determine the land capability classes of the development area according to this system. The data was developed using a spatial evaluation modelling approach (DALRRD, 2016).
- The long-term grazing capacity for South Africa (DALRRD, 2018) was analysed for the area and surrounding area of the development area. The values indicated for the different areas present long term grazing capacity with the understanding that the veld is in a relatively good condition.
- Land type data for the development area was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 – 2006). 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.

7.3 Site assessment

The development area was assessed on 19 to 22 June 2023. During the site visit, the farm portions of the development area were traversed by vehicle (where road access was available) and in areas of access limitations, observations were made by walking along transects through the different terrain units of the main land types.

For the soil classification, a hand-held bucket soil auger was used to observe soil profiles to a depth of 1.5m or refuse, depending on the effective soil depth of the area. Observations were made regarding soil form, texture, structure, nature and depth of underlying material as well as any signs of existing soil degradation.

Other observations made during the assessment include the agricultural activities of the development area, the quality of the natural vegetation that support livestock farming in the area and the presence of existing farming infrastructure that may be affected by the proposed project. The surrounding farms were also scanned to observe whether there may be other

existing or planned developments that will result in cumulative impacts on the soil and agricultural resources of the area.

7.4 Impact assessment methodology

Following the methodology prescribed by Savannah Environmental (Pty) Ltd., the direct, indirect and cumulative impacts associated with the project have been assessed in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
    - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
    - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
    - medium-term (5–15 years) – assigned a score of 3;
    - long term (> 15 years) - assigned a score of 4; or
    - permanent - assigned a score of 5;

- The **magnitude**, quantified on a scale from 0-10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1–5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- the **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be described as either positive, negative or neutral.
- the degree to which the impact can be reversed.
- the degree to which the impact may cause irreplaceable loss of resources.
- the *degree* to which the impact can be *mitigated.*

The **significance** is calculated by combining the criteria in the following formula:

$S=(E+D+M)P$

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

8. Study gaps, limitations and assumptions

- It is assumed that the proposed infrastructure development footprint will remain the same during the construction and operational phases of the project as proposed by the client and presented in this report. It is assumed that there will be no additional footprint areas without the required environmental authorisation.
- It is assumed that the teams responsible for the construction and operation of the infrastructure will follow best practice environmental management principles.
- No other uncertainties and gaps have been identified that may affect the conclusions made in this report.

9. Results of desktop analysis

9.1 Land capability

The land capability as determined by Department of Agriculture, Land Reform and Rural Development (DALRRD) through a spatial delineation process, was shown by overlying the development area boundary on the land capability raster data (DALRRD, 2016). According to DALRRD (2016), land capability is defined as the most intensive long-term use of land for purposed of rainfed farming determined by the interaction of climate, soil and terrain.

The FE Kudu WEF includes four different land capability classes within the development area as stated by the land capability data (DALRRD, 2016). Figure 3 shows the position of the different classes within the farm portion that form the proposed development area. Most of the development area largely consists of land with Low-Moderate (Class 06 and 07) and Moderate (Class 08) land capability. Moderate (Class 08) land capability is found mainly on the center and northwestern boundaries of the development area, whereas Low-Moderate (Class 06 and 07) land capability is found on the northeastern and eastern side. Small areas of Very low-Low (Class 04) and Low (Class 05) land capability is found in the northwestern and southern boundaries.

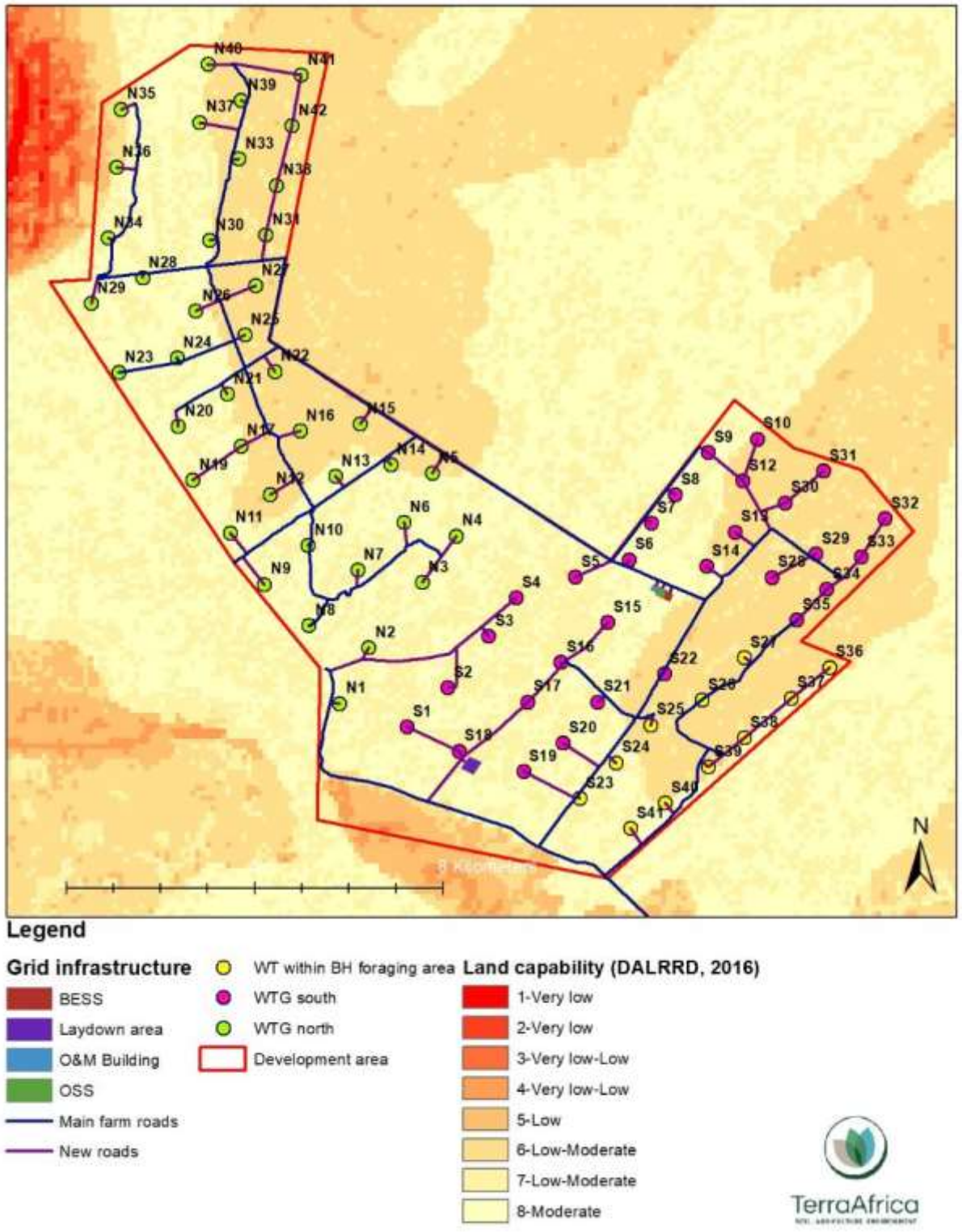
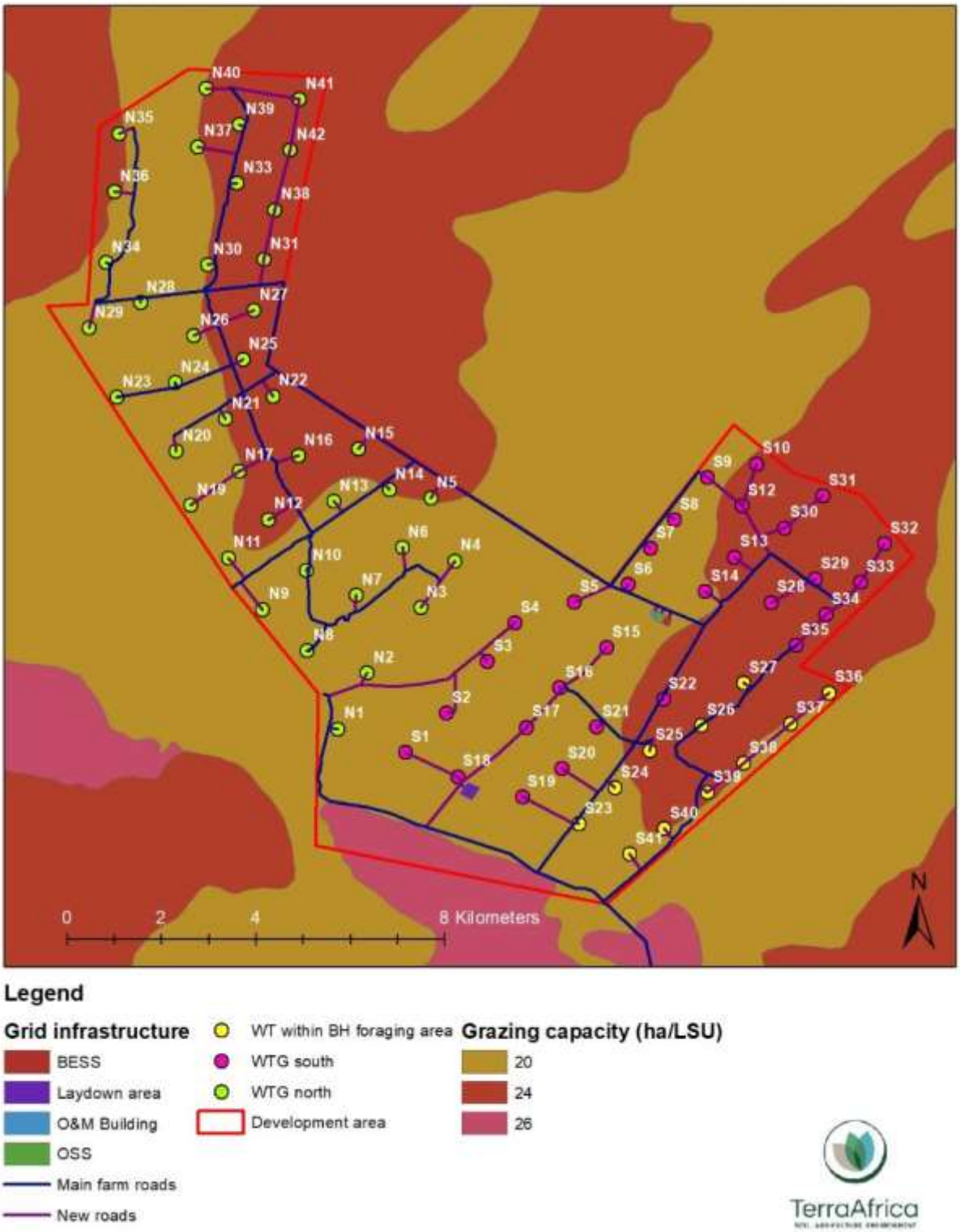


Figure 3: Land capability classification of the FE Kudu Wind Energy Facility development area and the surrounding area (data source: DALRRD, 2016).

9.2 Grazing capacity

Following the metadata layer obtained from DALRRD, the grazing capacity for most of the study area, is 20 ha/LSU, with 24ha/LSU and 26ha/LSU found in the eastern side (refer to Figure 4).



Legend

Grid infrastructure
- BESS
- Laydown area
- O&M Building
- OSS
- Main farm roads
- New roads

- WT within BH foraging area
- WTG south
- WTG north
- Development area

Grazing capacity (ha/LSU)
- 20
- 24
- 26

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Figure 4: Grazing capacity of the proposed FE Kudu Wind Energy Facility development area and surrounding area (data source: DALRRD, 2018).

The ideal grazing capacity of a specified area is an indication of the long-term production potential of the vegetation layer growing there to maintain an animal with an average weight of 450 kg (defined as 1 Large Stock Unit (LSU)) with an average feed intake of 10 kg dry mass per day over the period of approximately a year. This definition includes the condition that this feed consumption should also prevent the degradation of the soil and the vegetation. The grazing capacity is therefore expressed in several hectares per LSU (ha/LSU) (South Africa, 2018).

This unit used for large animals such as cattle can be converted to small animal units or small stock units (SSU). The conversion factor is 4 small stock units that equates one large stock unit. Since livestock farming in the region within which the development area is located is dominated by small stock farming, the grazing capacity of the 20ha/LSU which dominated the area can be converted to 5 ha/SSU and can thus provide forage to 1828 small stock units.

9.3 Land types

The study area consists of the Ia43, Ag9, and Fc410, land types (Figure 6). The Ia land type consists of deep alluvial soils comprising more than 60% of land type, while the Da land type consists of duplex soils (sandier topsoil abruptly overlying more clayey subsoil) allocated to more than 50% of land type. The Ag land type has freely drained, shallow (<300 mm deep), red, eutrophic, apedal soils that cover more than 40% of the land type.

<u>Land Type Ia43</u>

The Ia43 land type consists of two terrain units namely terrain unit 4 (10%) and terrain unit 5 (90%). Terrain unit 5 has a flat valley bottom with a slope % between 0 and 2% and a length of 100-500m. The unit consists mainly of the Oakleaf soil form (80%) as well as the Hutton (8%), Valsrivier (5%) and Dundee (5%) soil forms. The depth of these soils vary between 500 and 1200mm. As for terrain unit 4 it is a flat toe-slopes with a slope % of 1-2% and a length of 50-100m. The main soil forms are Oakleaf, Rock, Hutton, Valsrivier, Mispah, Swartland and Sterkspruit soil forms.

Terrain type / *Terreintipe :* A1

Terrain form sketch /*Terreinvormskets*

Land Type Ag9

Approximately 62% of the total area consisting of this land type, are long flat toe-slopes (Terrain unit 4) with slopes ranging between 2 to 4% and slopes of 1000 to 2000 m. These areas consist of a combination of soil forms including Oakleaf, Hutton, Swartland, Glenrosa and Mispah forms. The mid-slopes (Terrain unit 3) have slope between 5 and 10% where approximately 30% of soils consist of Rock, shallow Glenrosa and Mispah soils. The crests (Terrain unit 1) mainly consist of solid rock (not deeper than 0.35m). The landscape depressions or valley bottoms (Terrain unit 5) consist of medium-deep to deep (0.5 to 1.2m) soils of the Oakleaf, soil forms or the shallow Hutton soil.

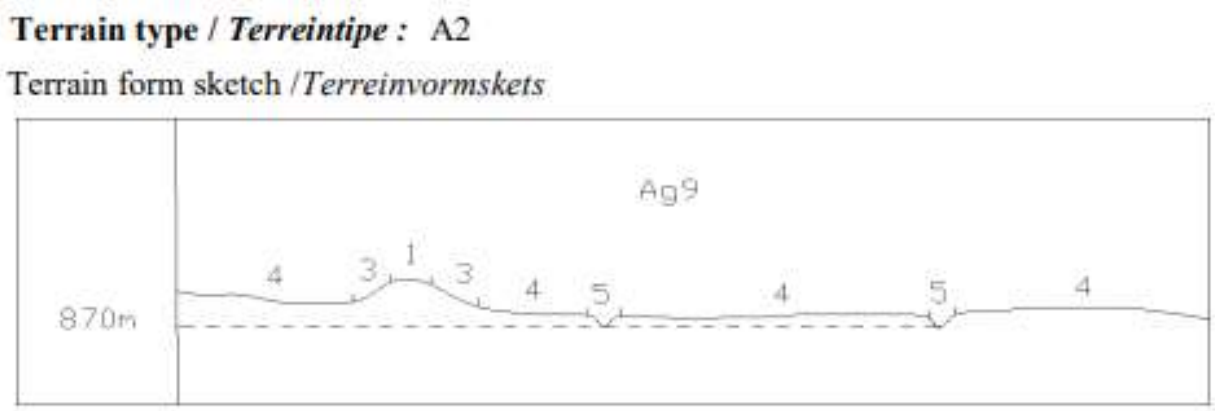
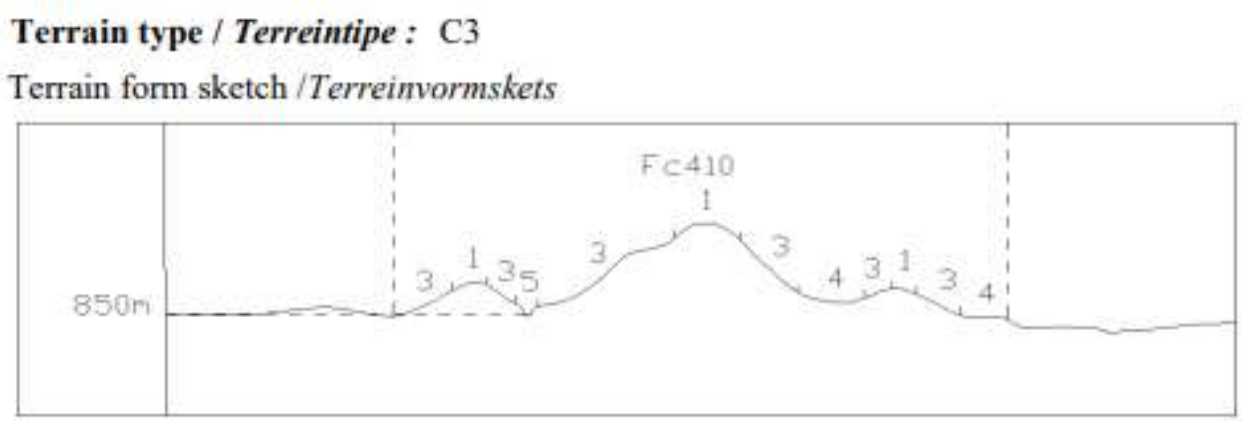


Figure 5: Terrain form sketch of Land Type Ag9.

Land Type Fc410

The Fc410 land type consist mainly of steep mid-slopes (Terrain unit 3) with slopes ranging between 6 to 15% and lengths of 600 to 1000 m. The main soil forms found in this terrain unit is the Hutton, Mispah and rock soil forms. The crest is second highest terrain unit covering 15% and has a slope% of 1-3% and a length between 50-100m. The main soil form is Glenrosa soil form followed by the rock and the Hutton soil form. Terrain unit 4 (toe-slope) and 5 (valley bottom) consist mainly of rock, Hutton, Mispah, Swartland, Oakleaf, Shortlands and Glenrosa soil forms.



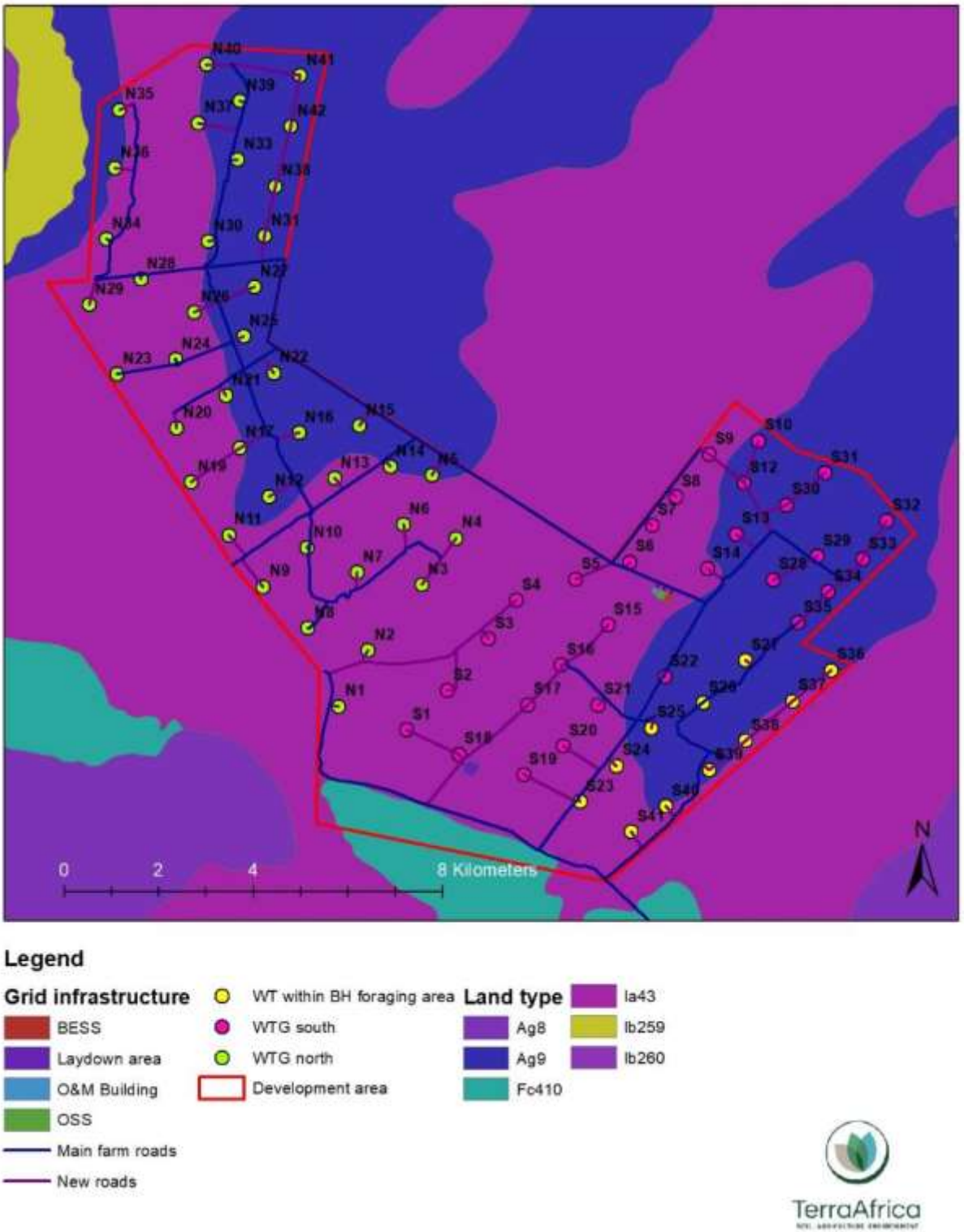


Figure 6: Land type classification of the proposed FE Kudu Wind Energy Facility and the surrounding area.

10. Results of the on-site sensitvity verification

10.1 Soil forms

The following soil forms are identified within the development area and included the Addo, Clovelly, Glenrosa, Mispah, Swartland and Valsrivier soil forms. The position of the soil within the development area is illustrated in Figure 7 and the properties of each soil form found in Table 1.

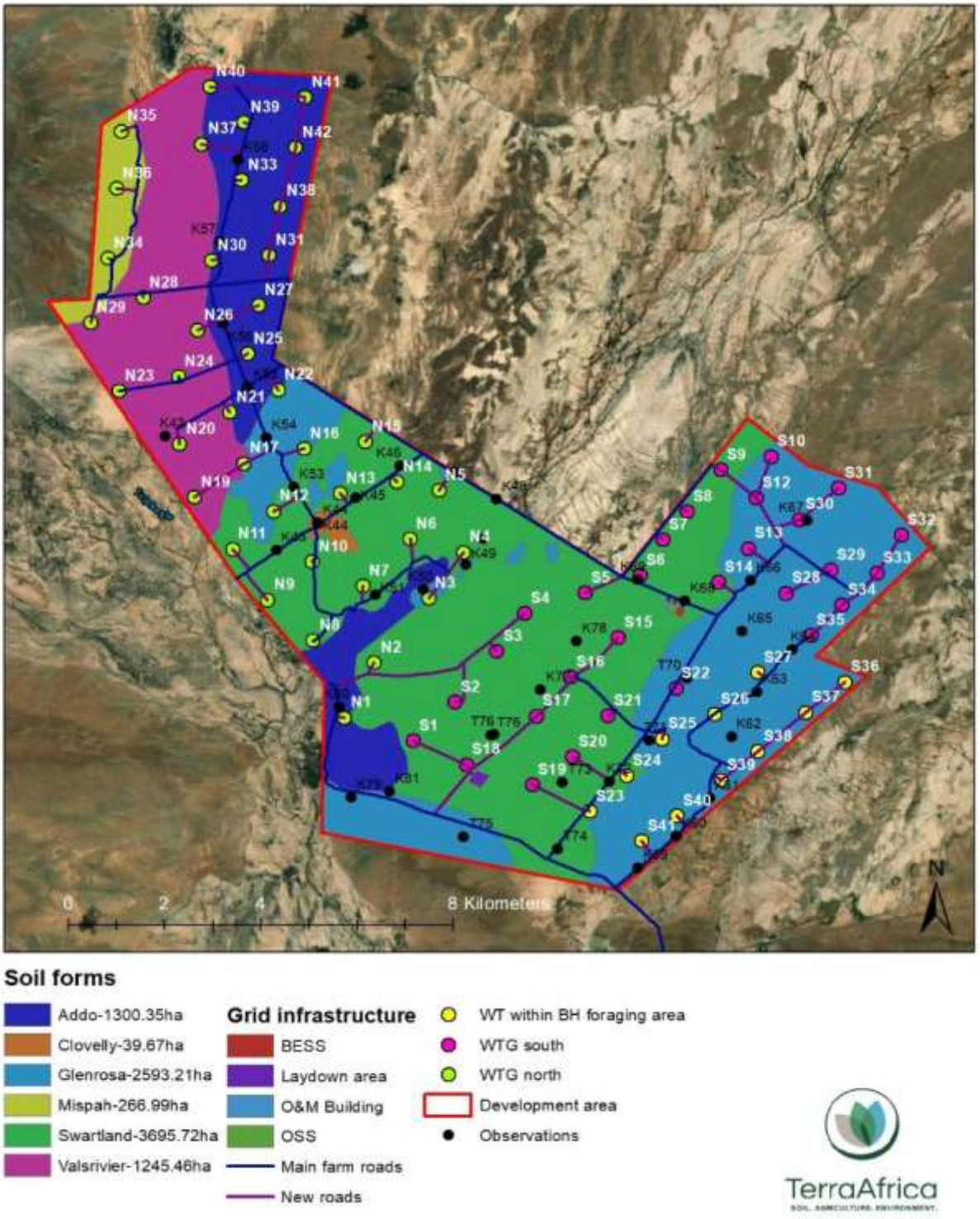


Figure 7: Soil classification map of the FE Kudu Wind Energy Facility development area.

Table 1: Soil form descriptions of the development area.

Soil form	Family	Horizons	Depths (m)	Texture and structure	Land-use	Land capability	Sensitivity	Figure
Addo	3110 The Addo soil consists of an bleached orthic horizon with a brown aluvic neocarbonate underneath. A soft carbonate is present underneath the neocarbonate.	A-orthic B-neocarbonate C-soft carbonate	A-0.2 B-0.8-1.0 C-1.0-1.2	The orthic has a weak structure with a low clay %. The neocarbonate is also weakly structured as defined for an aluvic horizon. The soft carbonate is powdery with clear lime concretions.	Livestock	Moderate (08)	Medium	Figure 8 A
Clovelly	2111 The Clovelly soil form consist of a chromic topsoil with a dystrophic yellow-brown apedal underneath. The yellow-brown is also aluvic with a saprolithic horizon underneath.	A-orthic B-yellow-brown C-lithic	A-0.2 B-0.6	Both the orthic and the yellow-brown has a weak to moderate structure and a loamy sand texture.		Moderate (08)	Medium	Figure 8 B
Glenrosa	2210 The Glenrosa soil forms has a chromic orthic horizon.. The material underneath the orthic was classified as saprolithic material that contain calcrete.	A-orthic B-lithic	A-0-0.3	The orthic of the Glenrosa is weakly structured in some areas and have an increase in clay% towards the southwestern area.		Low (05)	Low	Figure 8 C
Mispah	2210 The Mispah consists of a calcareous chromic topsoil and fractured rock underneath	A-orthic B-hard rock	A-0-0.2	The orthic of the Glenrosa is weakly structured and has a estimated sandy loam texture		Very low (2)	Low	Figure 8 D
Swartland	2111 The Swartland soil form consists of a bleached orthic horizon with a brown non-vertic pedocutanic horizon underneath. The pedocutanic is also non-	A-orthic B-pedocutanic C-lithic	A-0.2 B-0.6-1.0	The orthic of the Swartland has a weak to moderate structure and a sandy loam clay. The pedocutanic of the Swartland has a blocky structure and high clay%. The lithic of the Swartland could not be augured as it is restricted within the soil auger.		Low-Moderate (07)	Medium	Figure 9 E and G

	calcareous. A saprolithic horizon is found underneath the pedocutanic.							
Valsrivier	2120 The Valsrivier soil form consist of an chromic orthic horizon with a pedocutanic underneath. The pedocutanic was brown withinout vertic properties and is also calcareous.	A-orthic B-pedocutanic	A-0.2 B-1.5	The orthic of the Valsrivier has a moderate clay % and is estimated as loamy sand. The pedocutanic has a strong structure with angular coarse ped sizes. The pedocutanic has clear cutans and slickensides.		Low-Moderate (07)	Medium	Figure 9 F and H

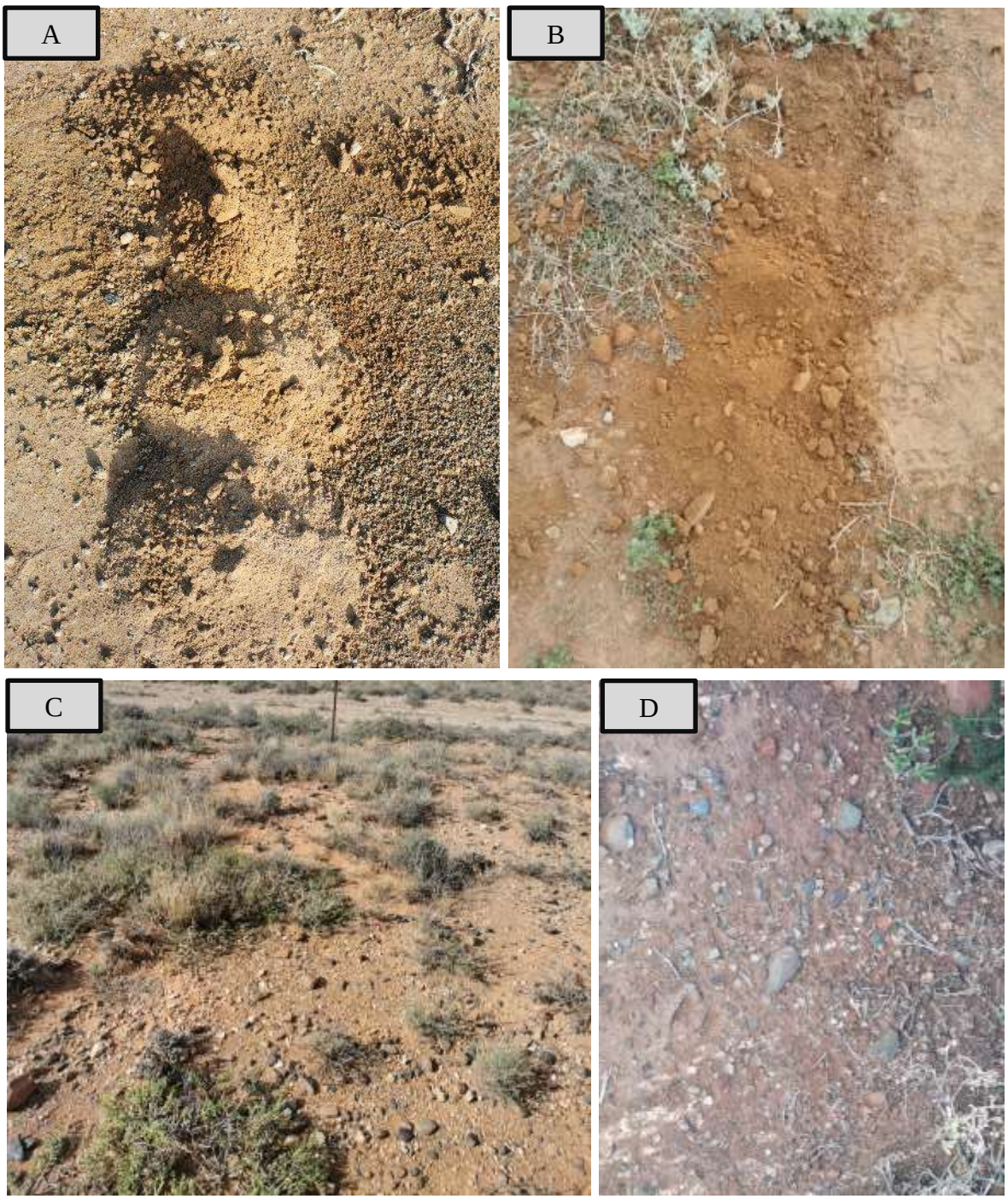


Figure 8: Addo (A), Clovelly (B), Glenrosa (C) and Mispah (D) soil forms.

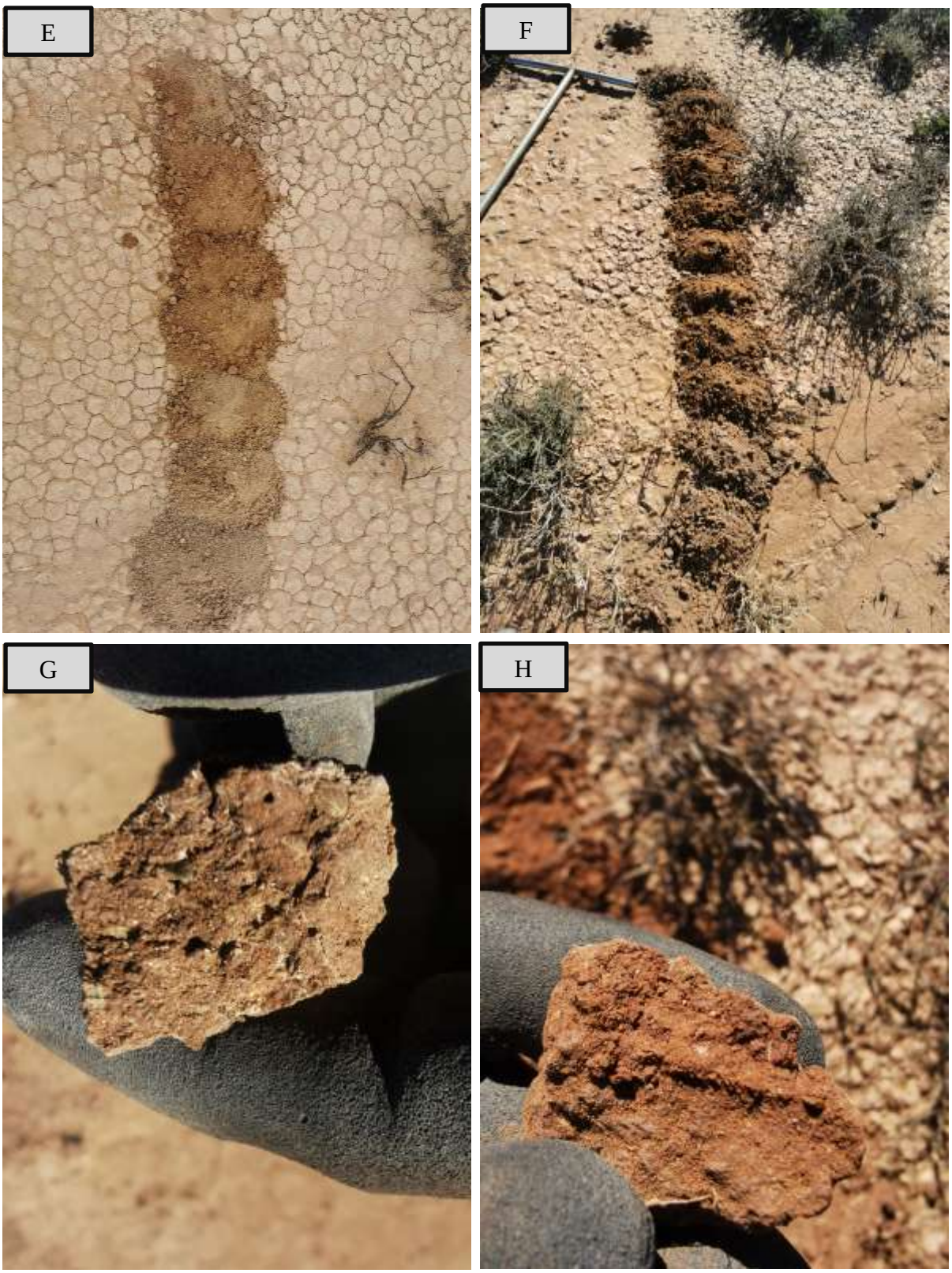


Figure 9: Swartland (E) and Valsrivier (F) soil forms.

10.2 Land capability classification

Following the soil classification and the consideration of the climate conditions of the area within which the proposed project will be located, the development area can be classified into four land capability classes (refer to Figure 10).

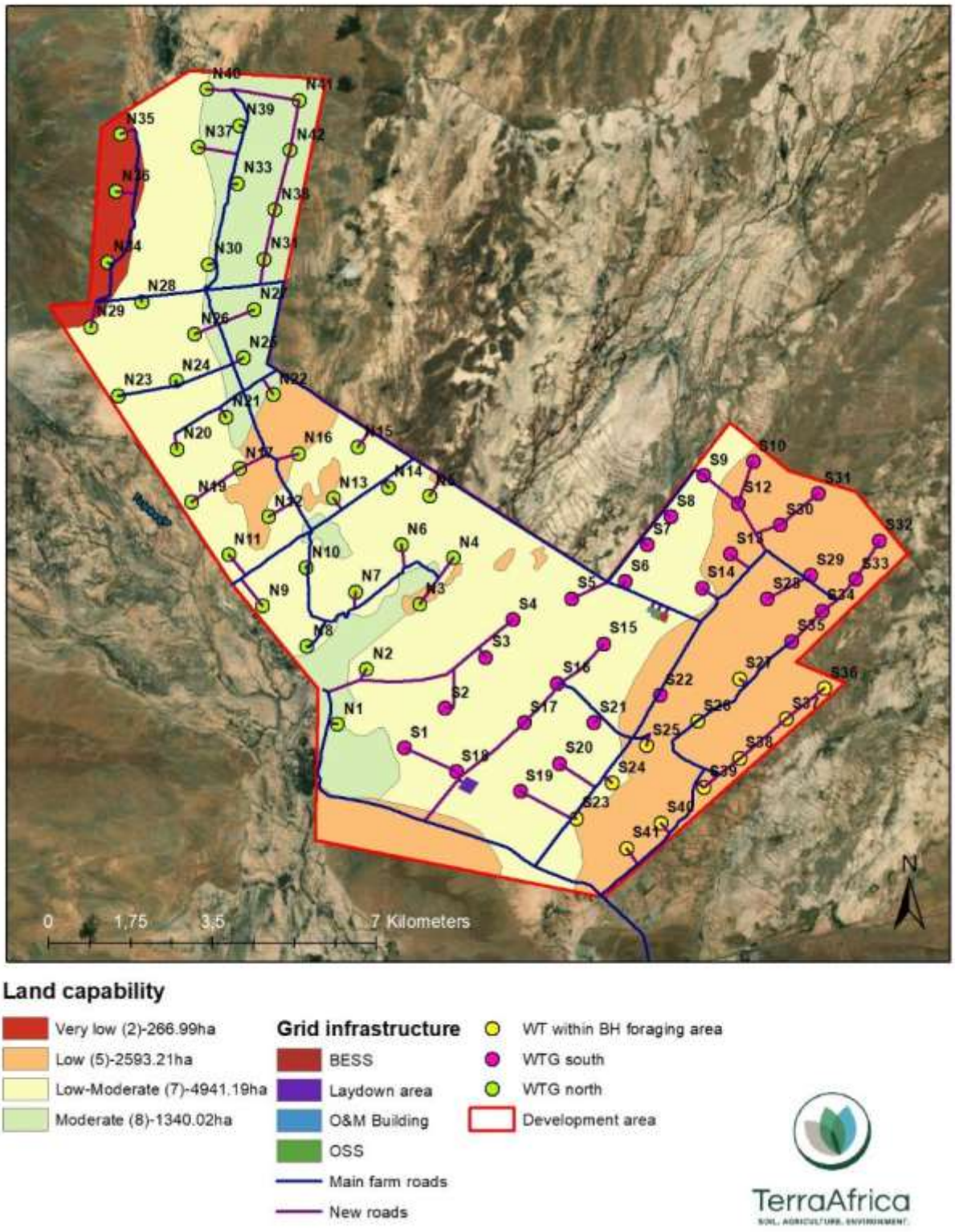


Figure 10: Land capability classification of the FE Kudu Wind Energy Facility development area.

Most of the development area has Low-Moderate (Class 07) land capability (4941.19ha) with most of the wind turbines falling within these areas. Turbines N21, 25, 27, 30, 31, 33, 38, 39, 40, 41 and 42, are the only turbines falling on a higher land capability of Moderate (Class 08). The Low-Moderate and Moderate land capability is attributed to the deep effective soil depth of the Swartland, Addo and Valsrivier soil forms, whereas the Low land capability is assigned to the Glenrosa and Mispah soil forms which have a shallow effective soil depth. The BESS, O&M building, OSS and Laydown area all fall on Low-Moderate (Class 07) land capability areas.

10.3 Land use and agricultural activities

The development area is mainly used for grazing and clear signs of water provision are seen in Figure 11. The field crop boundary map (Figure 12) shows that rainfed annual crops/planted pastures are present within the development area. During the site visit no other agricultural uses were identified and no crop fields or planted pastures were found.

Figure 11: Grazing small stock within the study area with signs of water provision for animals.

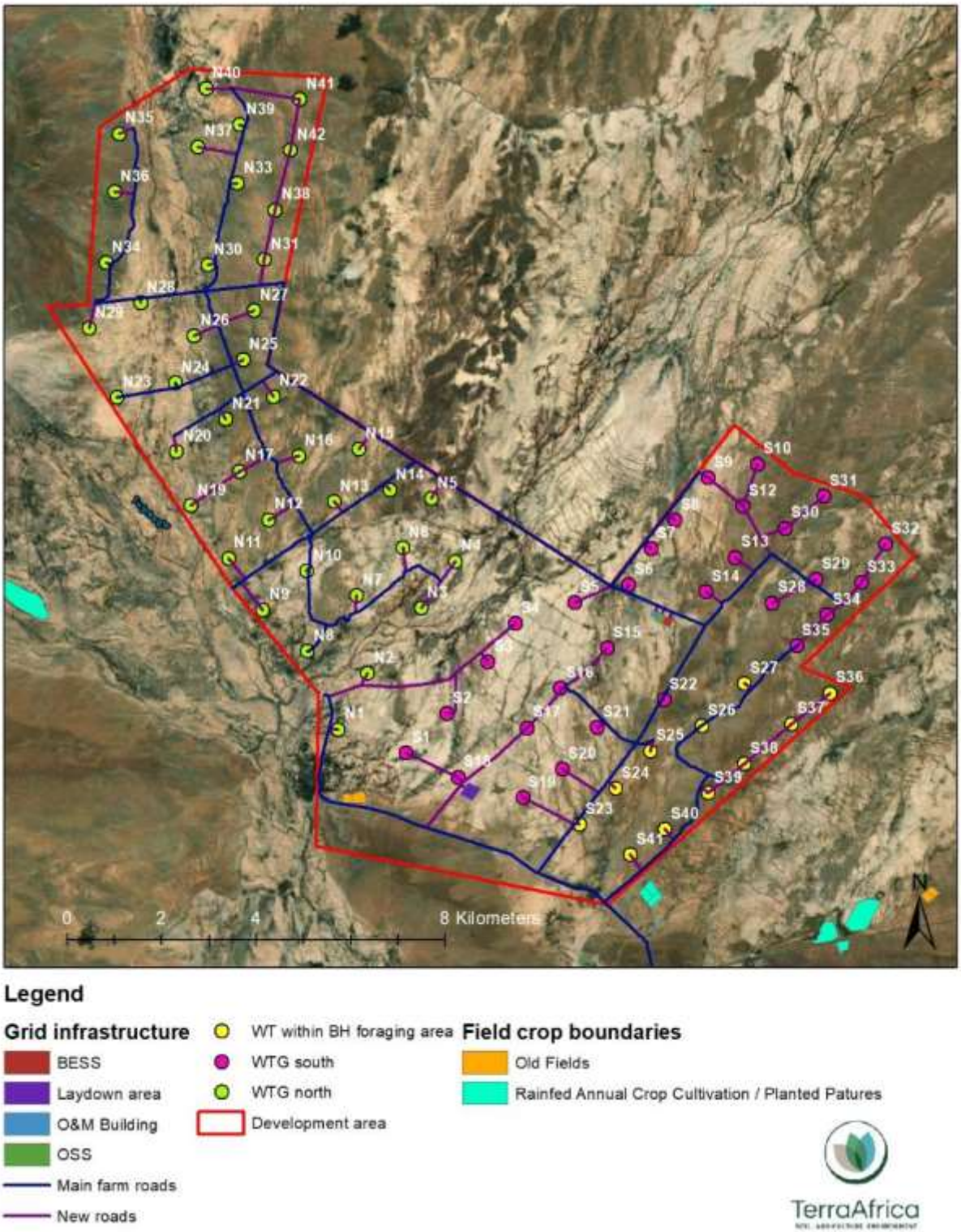


Figure 12: Field crop boundaries for the development area.

10.4 Sensitivity analysis

Following the consideration of all the desktop and gathered baseline data above, the development area can be classified as having a Low and Medium agricultural sensitivity to the proposed development (refer to Figure 13). The sensitivity rating considers the land capability and agricultural potential.

Most of the infrastructure components are located well within areas with Medium Sensitivity (refer to Figure 13). Medium agricultural sensitivity is mainly due to the high land capability of of Low-Moderate (Class 07) areas and the depth of the soil which ranged between 0.6 and 1.5m. Low agricultural sensitivity is due to the Low (Class 05) land capability and the absence of any field crop boundaries. Areas shown as having field crops did not show any signs of cultivation during the site visit. The Low Sensitivity areas have shallow effective soil depth, and the arid climate reduces the land capability of the area significantly. Approximately 29 wind turbines are found on Low agricultural sensitivity, while the rest is on Medium agricultural sensitivity.

Soil conservation and mitigation measures must be implemented to avoid soil particle loss through erosion as the soil regeneration potential of the area is very low and any soil losses will unlikely be replaced by young soil from soil formation processes. The anticipated impacts of the proposed project on the soil properties and land productivity are discussed in Section 10 below.

10.5 Allowable development limits

GNR 320 provides Allowable Development Limits for renewable energy generation developments of 20MW or more. The allowable development limits refer to the area of a particular land capability that can be directly impacted by a renewable energy development project. According to GNR 320, the physical footprint for the calculation of these limits is defined as “the area directly occupied by all infrastructure, including roads, hard standing areas, buildings, substations, etc. that is associated with the renewable energy generation 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 renewable energy facility, but includes the surface area required for expanding existing infrastructure (e.g. widening existing roads).”

The development footprint of the project will consist of the following components and measurements:

Contracted capacity	Up to 600MW (turbines up to 7.5MW in capacity)
Number of turbines	Up to 80 turbines[2]
Turbine hub height	Up to 164m
Turbine top tip height	Up to 250m
Rotor swept area	up to 21 000m^2
Capacity of on-site substation	132kV

[2] 42 north turbines, and 41 south turbines

Area occupied by the on-site substation	~ 2ha in extent
Underground cabling	Underground cabling, with a capacity of 33kV, will be installed to connect the turbines to the on-site facility substation.
Battery Energy Storage System (BESS)	Solid state battery technology (e.g. Lithium-ion technology) as a preferred technology. BESS will be housed in containers approximately 20m long, 3m wide, and 5m high with an approximate footprint of up to 5ha.
Operation and maintenance (O&M) buildings	~ 1ha in extent
Balance of plant area	Temporary laydown areas with an extent up to 6ha. Temporary warehouse of 1ha Temporary site camp establishment and concrete batching plants of 1ha.
Access and internal roads – Main road	Main access road to the site and between project components with a width up to 8m and a servitude of 13.5m.
Access and internal roads – internal network	Road network between project components with a width up to 8m
Turbine hardstand	~up to 7500m^2 per turbine
Turbine foundation	~ 1000m^2 per turbine

The total development footprint will measure up to 185 ha. Most of the infrastructure is located on land with Medium agricultural sensitivity. For a project of 600MW, the allowable limit on land with Medium sensitivity, is 210ha (0.35ha is allowed for every MW generated). The total development footprint of 185ha is therefore well within the allowable development limit.

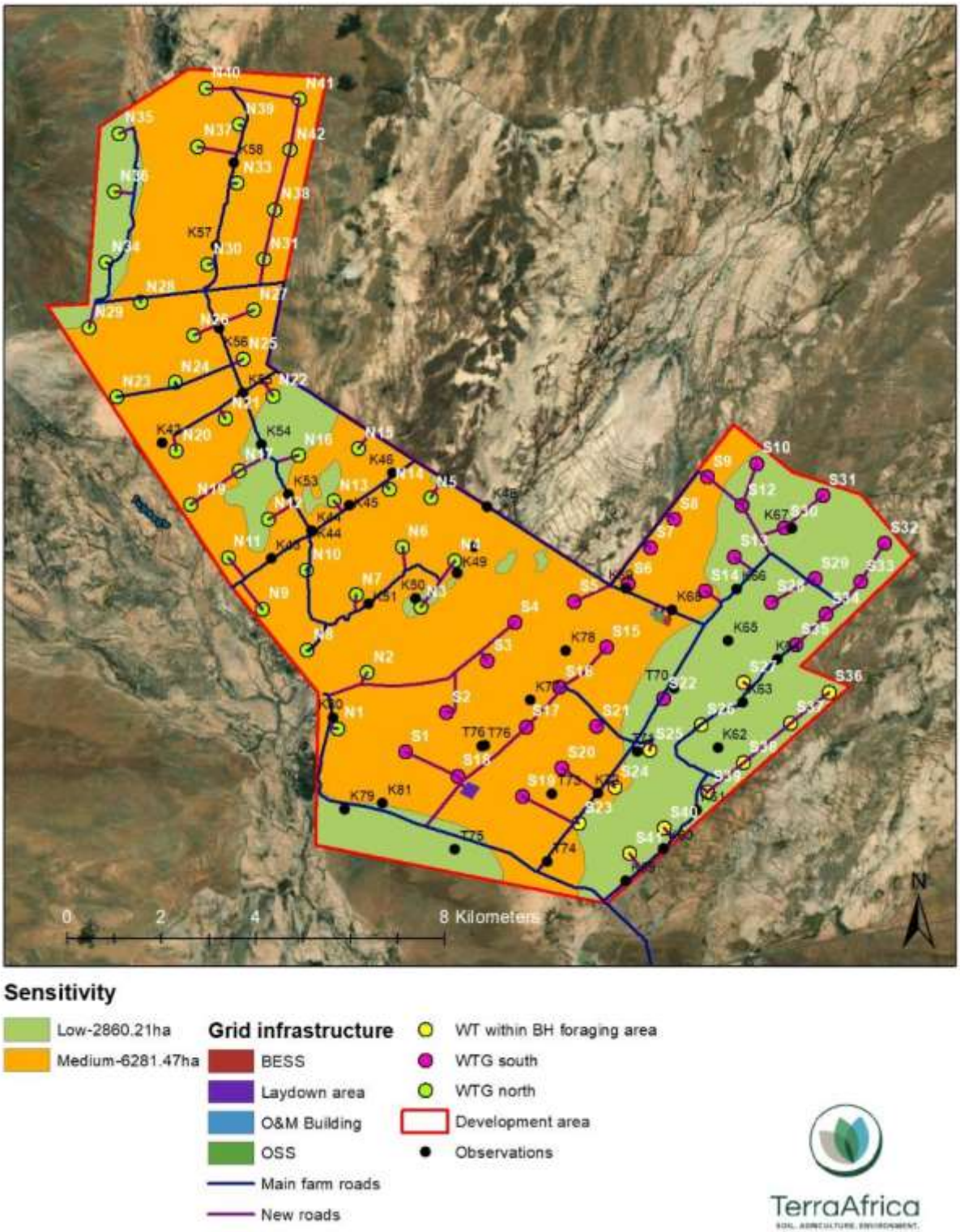


Figure 13: Infrastructure layout superimposed on the combined agricultural and soil sensitivity of the proposed FE Kudu Wind Energy Facility.

11. Impact assessment

11.1 Project description

The FE Kudu Wind Energy Facility will have a contracted capacity of up to 600MW and comprise wind turbines with a capacity of up to 7.5MW each. The project has a preferred project site of approximately ~9 170ha. Access to the site will be via an existing road off of the nearby R61. The FE Kudu Wind Energy Facility project site is proposed to accommodate the following infrastructure:

- Up to 80 wind turbines, turbine foundations and turbine hardstands
  - An on-site substation hub incorporating:
  - A132kV on-site facility substation
  - Switchyard with collector infrastructure
  - Battery Energy Storage System (BESS)
  - Operation and Maintenance buildings
  - A balance of plant area incorporating:
  - Temporary laydown areas
  - A construction camp laydown and temporary concrete batching plant
  - Power lines internal to the wind farm, trenched and located adjacent to internal access roads, where feasible[3].
  - Access roads to the site and between project components with a width up to 8m for primary access routes.

11.2 Description of project activities

The proposed development area currently has limited access roads. It is anticipated that the most significant change to the soil profiles will occur during the construction phase when the main and internal access roads as well as the areas where infrastructure will be erected, will be cleared of vegetation. During the construction phase, vehicles will traverse in and out of the construction camps and fuel, oils and greases that will be used by construction equipment and vehicles, may be stored on site. Construction materials will be transported and stored on site in the laydown areas.

During the operation phase, the footprint of the project will remain the same as that developed during the construction phase. Maintenance vehicles and equipment will travel on the main and internal access roads between the turbines and the offices and workshop. It is foreseen that these soil surfaces will remain bare and will be exposed to soil erosion by wind and water movement.

The decommissioning phase will have similar impacts to that of the construction phase as special cranes and other equipment will be used to remove the wind turbine materials. Soil in the areas where the turbine structures are removed will be exposed to soil erosion and soil

[3] The intention is for internal project cabling to follow the internal roads.

pollution with materials as well fuel and lubricants from the construction vehicles, are impacts associated with this phase.

11.3 Rating of impact significance

11.3.1 Construction phase

Impact: Reduction of land with natural vegetation for livestock grazing

Earth-moving equipment will be used to clear the vegetation from the access road areas as well as all the areas where structures will be erected. In areas where obstacles such as rock outcrops are present, earth-moving equipment will be used to remove these rocks and lithic material and level the surface.

Nature: The availability of grazing land that can be used for small stock farming will be reduced during the construction phase. It is anticipated that the impact will remain as long the infrastructure is present and the impact will only cease once all surface infrastructure has been decommissioned and vegetation has re-established in these areas.

	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Short duration - 2-5 years (2)	Very short duration - 0-1 years (1)
Magnitude	Low (4)	Minor (2)
Probability	Definite (4)	Probable (3)
Significance	**Low (28)**	**Low (12)**
Status (positive or negative)	Negative	Positive
Reversibility	High	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	N/A

Mitigation:

- Vegetation clearance must be restricted to infrastructure and access road areas.
- Materials and equipment must only be stored in the pre-determined laydown areas.
- Removal of obstacles to allow for access of construction vehicles must be kept to only were essential.
- Prior arrangements must be made with the landowner and neighbouring landowners to ensure that farm and game animals are moved to areas where they cannot be injured by vehicles traversing the area.
- No boundary fence must be opened without the landowner or neighbouring landowners' permission.
- No open fires made by the construction teams are allowable during the construction phase.
- The supporting infrastructure must be constructed as closely as possible together to avoid fragmentation of the entire development area.
- FE Kudu (Pty) Ltd must communicate with the landowner on access restriction around the infrastructure to ensure the landowner is not expecting to return sheep farming to areas of the farm where it will no longer be possible.

Residual Impacts:

The residual impact from the construction of the project is considered low.

Cumulative Impacts:

Any additional wind energy facilities or other renewable projects to be developed in the area, will result in additional areas where grazing veld will be unavailable for small stock farming.

Impact: Soil erosion

All areas where vegetation is removed from the soil surface will result in exposed soil surfaces that will be prone to erosion. Currently, all existing access roads within the development area

are unsurfaced and have high risk of soil erosion, especially after rainfall events. Both wind and water erosion are a risk and even though the project area is in an arid climate, the intensity of a single rainstorm may result in soil particles being transported away. Once the soil particles are removed, vegetation will have difficulty establishing itself on the rock, lithic and hard carbonate material in the area.

Nature: The clearing and levelling of a limited area of land within the proposed development area will increase the risk of soil erosion in the area. The existing gravel roads are already at risk of soil erosion and vehicle access on unsurfaced access roads will increase the risk of soil erosion. It is anticipated that the risk will naturally reduce as grass and lower shrubs re-establishes in the area once the construction has been completed and the operation phase commences.

	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	**Medium (30)**	**Low (16)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	N/A

Mitigation:

- Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude;
- Unnecessary land clearance must be avoided;
- Prioritise the stabilisation and surfacing of existing access roads to prevent soil erosion during the rainy season.
- Evaluate access roads weekly during the rainy season to detect early onset of erosion and rehabilitate any eroded areas immediately.
- Implement a Stormwater Management Plan (SWMP) that includes stormwater drainage structures on access roads as well as around any other hardened surfaces such as the turbine hardstands and the O&M buildings.
- Level any remaining soil removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface.
- Regularly monitor the site to check for areas where signs of soil erosion may start to appear.
- Should any soil erosion be detected, it must be addressed immediately through rehabilitation and surface stabilisation techniques.

Residual Impacts:

The residual impact from the construction of the Kudu Wind Energy Facility project on the susceptibility to erosion is considered low.

Cumulative Impacts:

Any additional wind energy facilities or other renewable projects to be developed in the area, will result in additional areas being exposed to soil erosion through wind and water movement.

<u>Impact: Soil pollution</u>

During the construction phase, construction workers will traverse through the area with vehicles and construction equipment. Both potential spills and leaks from construction vehicles and equipment as well as waste generation on site, can result in soil pollution.

Nature: The following construction activities can result in the chemical pollution of the soil:

1. Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the removal of vegetation as part of site preparation.

2. Spills from vehicles transporting workers, equipment, and construction material to and from the construction site.
3. The accidental spills from temporary chemical toilets used by construction workers.
4. The generation of domestic waste by construction workers.
5. Spills from fuel storage tanks during construction.
6. Pollution from concrete mixing.
7. Any construction material remaining within the construction area once construction is completed.

	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Low (4)	Improbable (2)
Significance	**Medium (36)**	**Low (14)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	N/A

Mitigation:

- Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills;
- Any waste generated during construction, must be stored in designated containers and removed from the site by the construction teams; and
- Any left-over construction materials must be removed from site.

Residual Impacts:

The residual impact from the construction of the proposed project will be low to negligible.

Cumulative Impacts:

Any additional wind energy facilities or other renewable projects to be developed in the area where waste is not removed to designated waste sites, will increase the cumulative impacts associated with soil pollution in the area.

Impact: Soil compaction

The weight of vehicles and equipment traversing in the construction areas as well as deliberate compaction in areas where buildings will be constructed, will reduce the pore space between soil particles and reduce the water infiltration rate of soil. The reduced water infiltration will increase the risk of soil erosion during rainfall event, especially in the areas of the access roads as well as any hardened surfaces.

Nature: The clearing and levelling of land for the wind turbines and supporting infrastructure as well as the access roads, will result in soil compaction. In the area where the access road will be constructed, topsoil will be removed, and the remaining soil material will be deliberately compacted to ensure a stable road surface. While the Glenrosa soils (present in the largest part of the development area) are less prone to soil compaction, the rest of the soil forms in the development area are susceptible to soil erosion as a result of the higher silt and clay content.

	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	**Medium (30)**	**Low (16)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No

Can impacts be mitigated?	Yes	N/A
Mitigation:		
• Vehicles and equipment must travel within demarcated areas and not outside of the construction footprint; • Unnecessary land clearance must be avoided; • Where possible, conduct the construction activities outside of the rainy season; and • Vehicles and equipment must park in designated parking areas.		
Residual Impacts:		
The residual impact from the construction of the proposed project on soil compaction is considered low.		
Cumulative Impacts:		
Any additional wind energy facilities or other renewable projects to be developed in the area, will result in additional areas being exposed to soil compaction.		

11.3.2 Operation phase

During the operation phase, maintenance personnel will traverse between the wind turbines and the offices and workshop to ensure that the infrastructure functions optimally and to do repairs where necessary. This phase will have no additional impact on the livestock farming potential of the area. The following impact on soil is expected for this phase:

Impact: Soil erosion

Nature: The areas where vegetation was cleared, will remain at risk of soil erosion, especially during a rainfall event when runoff from the cleared surfaces will increase the risk of soil erosion in the areas directly surrounding the wind turbines and buildings.		
	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	**Medium (30)**	**Low (16)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	N/A
Mitigation:		
• Evaluate access roads weekly during the rainy season to detect early onset of erosion and rehabilitate any eroded areas immediately. • Implement a Stormwater Management Plan (SWMP) that includes stormwater drainage structures on access roads as well as around any other hardened surfaces such as the turbine hardstands and the O&M buildings. • The rest of the development area must regularly be monitored to detect early signs of soil erosion on-set. • If soil erosion is detected, the area must be stabilised by the use of geo-textiles and facilitated re-vegetation.		
Residual Impacts:		
The residual impact from the operation of the FE Kudu Wind Energy Facility on the susceptibility to erosion is considered low.		
Cumulative Impacts:		
Any additional wind energy facilities or other renewable projects to be developed in the area, will result in additional areas being exposed to soil erosion through wind and water movement.		

Impact: Soil pollution

During the operation phase, engineers and maintenance workers will travel between the wind turbines, substations, offices and workshop to ensure that the project is maintained, and repairs are done. During the operation phase, potential spills and leaks from maintenance vehicles and equipment as well as waste generation on site, can result in soil pollution.

Nature: During the operation phase of the project, the following activities can result in the chemical pollution of the soil: 1. Petroleum hydrocarbon (present in oil and diesel) spills by maintenance machinery and vehicles. 2. The generation of domestic waste by maintenance staff.		
	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Low (4)	Improbable (2)
Significance	**Medium (36)**	**Low (14)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	N/A
Mitigation: • Maintenance must be undertaken regularly on all vehicles and maintenance machinery to prevent hydrocarbon spills. • No domestic and other waste must be left at the site and must be transported with the maintenance vehicles to an authorised waste dumping area.		
Residual Impacts: The residual impact from the operation of the proposed project will be low to negligible.		
Cumulative Impacts: Any additional wind energy facilities or other renewable projects to be developed in the area and where waste is not removed to designated waste sites, will increase the cumulative impacts associated with soil pollution in the area.		

11.3.3 Decommissioning phase

The decommissioning phase will have the same impacts as the construction phase i.e. soil erosion and soil pollution. Even though roads will then exist, areas where infrastructure is removed will present bare surfaces at risk of soil erosion through wind and rainfall. It is anticipated that especially the risk of soil erosion will remain until the vegetation growth has re-established in the area where the infrastructure of the FE Kudu Wind Energy Facility was decommissioned.

12. Cumulative impacts

"Cumulative Impact", in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity that in itself may not be significant, but may become significant when added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities[4].

The role of the cumulative assessment is to test if such impacts are relevant to the proposed project in the proposed location (i.e. whether the addition of the proposed project in the area will increase the impact). Within 30km of the development area, four onshore wind projects have already been authorised. The Aberdeen Wind 1, 2 and 3 wind farms and Eskom Aberdeen wind farm are located south of the development area. The Kariega wind facility cluster is located west of the current development area, and the FE Tango Wind Energy Facility is located west of the development area (refer to Figure 14).

Below follows the rating of each of the cumulative impacts.

[4] Unless otherwise stated, all definitions are from the EIA Regulations 2014 (GNR 326).

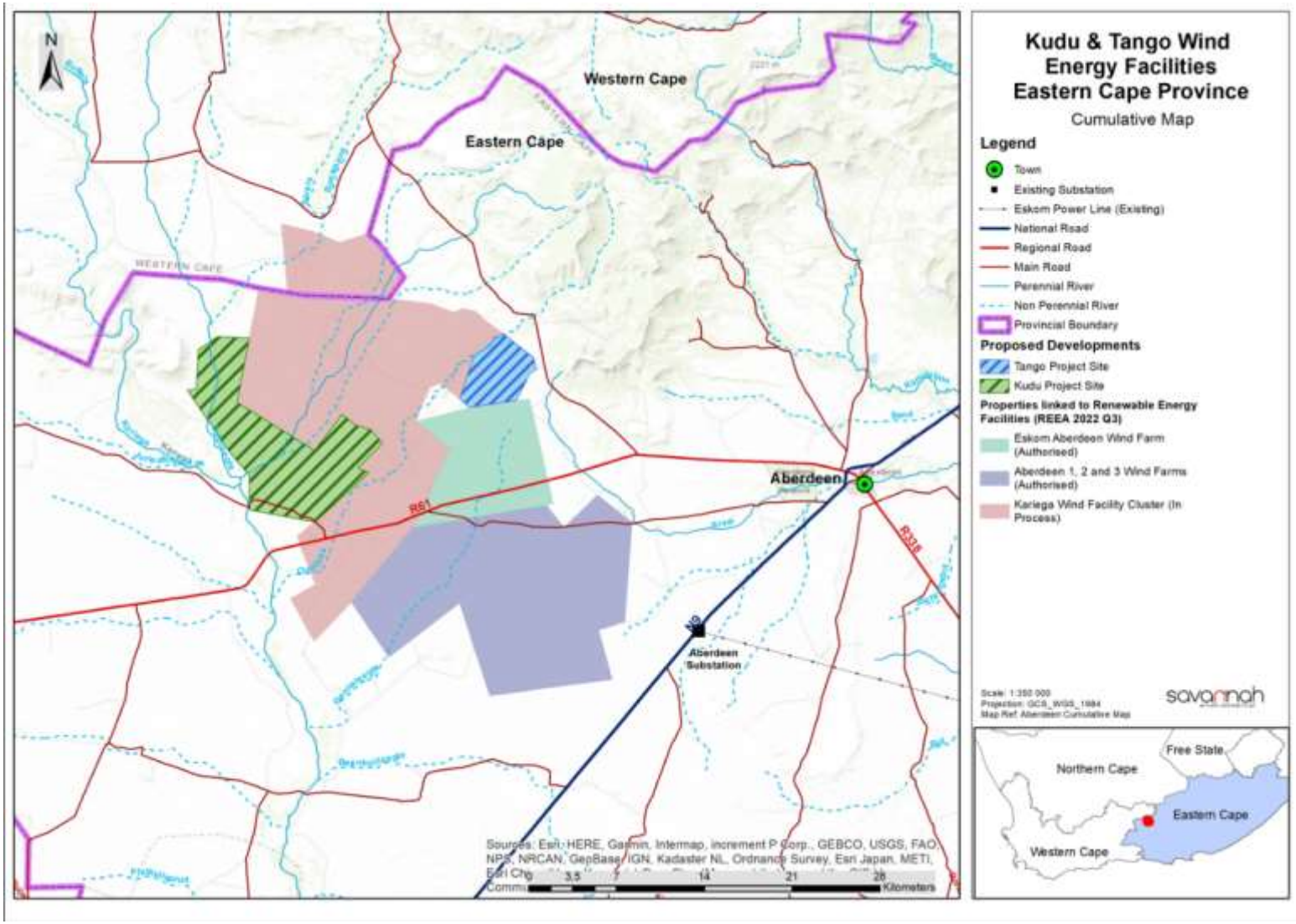


Figure 14: Locality of other renewable energy projects in the area that may result in cumulative impacts.

Table 2: Cumulative impact of areas susceptible to soil erosion

Nature: Increase in areas susceptible to soil erosion as there will be new areas where there will be clearing and levelling of land for the construction of the infrastructure. Additional traffic on the existing gravel roads (that are already at risk of soil erosion) will further increase the risk of soil erosion.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Low (4)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	**Low (16)**	**Medium (33)**
Status (positive/negative)	Negative	Negative
Reversibility	Low	Low
Loss of resources?	No	Yes
Can impacts be mitigated?	Yes	No
Confidence in findings: High.		
Mitigation: Each of the projects should adhere to the highest standards for soil erosion prevention and management as defined in Section 11.3.1 above.		

Table 3: Cumulative impact of areas with compacted soils

Nature: Increase in areas with compacted soils because any additional access roads, hardstands for turbines and buildings will require deliberate compaction to ensure a stable surface prior to construction. While the Glenrosa soils (present in the largest part of the development area) are less prone to soil compaction, the rest of the soil forms in the development area are susceptible to soil erosion because of the higher silt and clay content.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Low (4)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	**Low (16)**	**Medium (33)**
Status (positive/negative)	Negative	Negative
Reversibility	Low	Low
Loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	No
Confidence in findings: High.		
Mitigation: Each of the projects should adhere to the highest standards for soil erosion prevention and management as defined in Section 11.3.1 above.		

Cumulative impact of increased risk of soil pollution

Nature: Increase in areas at risk of soil pollution, especially during the construction phase. Each of the projects that contribute to cumulative impacts will require construction workers to traverse the area in vehicles and use equipment. The vehicles and equipment pose the risk of leaks that add petroleum hydrocarbons to soil. The

construction phase will include cement mixing and the generation of general waste on site, with all unmanaged waste a potential source of soil contaminants.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	**Low (27)**	**Medium (30)**
Status (positive/negative)	Negative	Negative
Reversibility	Low	Low
Loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	No
Confidence in findings: High.		
Mitigation: Each of the projects should adhere to the highest standards for soil pollution prevention and management as defined in Section 11.3.1 above.		

13. Acceptability statement

Following the data analysis and impact assessment above, the proposed FE Kudu Wind Energy Facility is considered an acceptable development within the development area that was assessed. The development area consists mainly of the Glenrosa and Swartland soil forms. The Glenrosa has shallow soil depths which decreases the effective soil depth and thus lowers the land capability to Low (Class 05). The Swartland conversely has a much deeper depth and thus a more effective soil depth which gives it a Low-Moderate (Class 07) land capability. The area is dominated by Medium agricultural sensitive areas with only 29 turbines out of 80 falling on Low agricultural sensitivity. Although most of the area is allocated a Medium sensitivity, the area is only used for livestock grazing as was observed during the site visit. Additionally, no field crops were present within the development area.

While the development of a wind energy facility may be a more sustainable land use than agriculture in this area, the project will have negative impacts on the soil quality of the areas to be affected by the infrastructure. These impacts include the risks of soil erosion, soil compaction and soil contamination. It is anticipated that the construction phase will have impacts that range from medium to low and that through the consistent implementation of the recommendation mitigation measures, these impacts can all be reduced to low and acceptable levels. Impacts during the operation phase are associated with possible repairs that may be required at the turbines or any other equipment that may require repairs.

It is my professional opinion that this application be considered favourably, permitting that the mitigation measures are successfully implemented. The project infrastructure should also remain within the development area boundaries and in the positions indicated in the layout map.

14. Reference list

Department of Agriculture, Forestry and Fisheries, 2016. National land capability evaluation raster data: Land capability data layer, 2016. Pretoria.

Land Type Survey Staff (1972 – 2006). *Land Types of South Africa data set*. ARC – Institute for Soil, Climate and Water. Pretoria.

South Africa (Republic) 2018. *Long-term grazing capacity for South Africa*: Data layer. Government Gazette Vol. 638, No. 41870. 31 August 2018. Regulation 10 of the Conservation of Agricultural Resources Act (CARA): Act 43 of 1983. Pretoria. Government Printing Works.

The Soil Classification Working Group (2018). *Soil Classification – Taxonomic System for South Africa.* Dept. of Agric., Pretoria.

APPENDIX 1 – SPECIALIST DECLARATION OF INDEPENDENCE

forestry, fisheries & the environment

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

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

SPECIALIST DECLARATION FORM – AUGUST 2023

Specialist Declaration form for assessments undertaken for application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

REPORT TITLE
FE Kudu Wind Energy Facility, Eastern Cape Province

Kindly note the following:

1. This form must always be used for assessment that are in support of applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting, where this Department is the Competent Authority.
2. This form is current as of August 2023. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.dffe.gov.za/documents/forms.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with '*the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the act, when applying for environmental authorisation - GN 320/2020)*', where applicable.

1. SPECIALIST INFORMATION

Title of Specialist Assessment	Agricultural Assessment
Specialist Company Name	TerraAfrica Consult cc
Specialist Name	Mariné Pienaar
Specialist Identity Number	8207250025080
Specialist Qualifications:	MSc. Environmental Science, BSc. Agric Plant Production
Professional affiliation/registration:	SACNASP & SSSSA
Physical address:	Farm Strydpoort, Ottosdal, 2610
Postal address:	P.O. Box 433
Postal address	Ottosdal, 2610
Telephone	0828283587
Cell phone	0828283587
E-mail	mpienaar@terraafrica.co.za

SPECIALIST DECLARATION FORM – AUGUST 2023

2. DECLARATION BY THE SPECIALIST

I, Mariné Pienaar declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing –
  - any decision to be taken with respect to the application by the competent authority; and;
  - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of section 24F of the NEMA Act.

Signature of the Specialist

TerraAfrica Consult cc

Name of Company:

17 Aug 2023

Date

SPECIALIST DECLARATION FORM – AUGUST 2023

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, _ Mariné Pienaar_____, 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

TerraAfrica Consult cc

Name of Company

2023-08-17

Date

Signature of the Commissioner of Oaths

17 Aug 2023

Date

17/08/2023

Commissioner of Oaths (RSA)
Stephanus Francois Kasselman
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APPENDIX 2 – CURRICULUM VITAE OF SPECIALIST

MARINÉ PIENAAR

Specialist Scientist

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Wolmaransstad,
South Africa

EXPERTISE

Soil Quality Assessment

Soil Policy and Guidelines

Agricultural Agro-Ecosystem Assessment

Sustainable Agriculture

Data Consolidation

Land Use Planning

Soil Pollution

Hydropedology

EDUCATION

MASTER'S DEGREE
Environmental Science
University of Witwatersrand
2010 – 2018

BACHELOR'S DEGREE
Agricultural Science
University of Pretoria
2001 – 2004

PROFESSIONAL PROFILE

I contribute specialist knowledge on agriculture and soil management to ensure long-term sustainability of projects in Africa. For the past thirteen years, it has been my calling and I have consulted on more than 200 projects. My clients include environmental and engineering companies, mining houses, and project developers. I enjoy the multi-disciplinary nature of the projects that I work on and I am fascinated by the evolving nature of my field of practice. The next section provide examples of the range of projects completed. A comprehensive project list is available on request.

PROJECT EXPERIENCE

Global Assessment on Soil Pollution

Food and Agricultural Organisation (FAO) of the United Nations (UN)

Author of the regional assessment of Soil in Sub-Saharan Africa. The report is due for release in February 2021. The different sections included:

- Analysis of soil and soil-related policies and guidelines for each of the 48 regional countries
- Description of the major sources of soil pollution in the region
- The extent of soil pollution in the region and as well as the nature and extent of soil monitoring
- Case study discussions of the impacts of soil pollution on human and environmental health in the region
- Recommendations and guidelines for policy development and capacitation to address soil pollution in Sub-Saharan Africa

Data Consolidation and Amendment

Range of projects: Mining Projects, Renewal Energy

These projects included developments where previous agricultural and soil studies are available that are not aligned with the current legal and international best practice requirements such as the IFC Principles. Other projects are expansion projects or changes in the project infrastructure layout. Tasks on such projects include the incorporation of all relevant data, site verification, updated baseline reporting and alignment of management and monitoring measures.

Project examples:

- Northam Platinum's Booysendal Mine, South Africa
- Musonoi Mine, Kolwezi District, Democratic Republic of Congo
- Polihali Reservoir and Associated Infrastructure, Lesotho
- Kaiha 2 Hydropower Project, Liberia
- Aquarius Platinum's Kroondal and Marikana Mines

MARINÉ PIENAAR

Specialist Scientist

PROFESSIONAL MEMBERSHIP

South African Council for Natural Scientific Professions (SACNASP)

Soil Science Society of South Africa (SSSSA)

Soil Science Society of America (SSSA)

Network for Industrially Contaminated Land in Africa (NICOLA)

LANGUAGES

English (Fluent)

Afrikaans (Native)

French (Basic)

PRESENTATIONS

There is spinach in my fish pond
TEDx Talk
Available on YouTube

♦

Soil and the Extractive Industries
Session organiser and presenter
Global Soil Week, Berlin (2015)

♦

How to dismantle an atomic bomb
Conference presentation (2014)
Environmental Law Association (SA)

PROJECT EXPERIENCE (Continued)

Agricultural Agro-Ecosystem Assessments

Range of projects: Renewable Energy, Industrial and Residential Developments, Mining, Linear Developments (railways and power lines)

The assessments were conducted as part of the Environmental and Social Impact Assessment processes. The assessment process includes the assessment of soil physical and chemical properties as well as other natural resources that contributes to the land capability of the area.

Project examples:

- Mocuba Solar PV Development, Mozambique
- Italthai Railway between Tete and Quelimane, Mozambique
- Lichtenburg PV Solar Developments, South Africa
- Manica Gold Mine Project, Mozambique
- Khunab Solar PV Developments near Upington, South Africa
- Bomi Hills and Mano River Mines, Liberia
- King City near Sekondi-Takoradi and Appolonia City near Accra, Ghana
- Limpopo-Lipadi Game Reserve, Botswana
- Namoya Gold Mine, Democratic Republic of Congo

Sustainable Agriculture

Range of projects: Policy Development for Financial Institutions, Mine Closure Planning, Agricultural Project and Business Development Planning

Each of the projects completed had a unique scope of works and the methodology was designed to answer the questions. While global indicators of sustainable agriculture are considered, the unique challenges to viable food production in Africa, especially climate change and a lack of infrastructure, in these analyses.

Project examples:

- Measurement of sustainability of agricultural practices of South African farmers – survey design and pilot testing for the LandBank of South Africa
- Analysis of the viability of avocado and mango large-scale farming developments in Angola for McKinsey & Company
- Closure options analysis for the Tshipi Borwa Mine to increase agricultural productivity in the area, consultation to SLR Consulting
- Analysis of risks and opportunities for farm feeds and supplement suppliers of the Southern African livestock and dairy farming industries
- Sustainable agricultural options development for mine closure planning of the Camutue Diamond Mine, Angola

MARINÉ PIENAAR

Specialist Scientist

PROFESSIONAL DEVELOPMENT

Contaminated Land Management 101 Training
Network for Industrially Contaminated Land in Africa
2020

Intensive Agriculture in Arid & Semi-Arid Environments
CINADCO/MASHAV R&D Course, Israel
2015

World Soils and their Assessment Course
ISRIC – World Soil Information Centre, Netherlands
2015

Wetland Rehabilitation Course
University of Pretoria
2010

Course in Advanced Modelling of Water Flow and Solute Transport in the Vadose Zone with Hydrus
University of Kwazulu-Natal
2010

Environmental Law for Environmental Managers
North-West University Centre for Environmental Management
2009

PROJECT EXPERIENCE (Continued)

Soil Quality Assessments

Range of projects: Rehabilitated Land Audits, Mine Closure Applications, Mineral and Ore Processing Facilities, Human Resettlement Plans

The soil quality assessments included physical and chemical analysis of soil quality parameters to determine the success of land rehabilitation towards productive landscapes. The assessments are also used to understand the suitability for areas for Human Resettlement Plans

Project examples:

- Closure Planning for Yoctolux Colliery
- Soil and vegetation monitoring at Kingston Vale Waste Facility
- Exxaro Belfast Resettlement Action Plan Soil Assessment
- Soil Quality Monitoring of Wastewater Irrigated Areas around Matimba Power Station
- Keaton Vanggatfontein Colliery Bi-Annual Soil Quality Monitoring

REFERENCES

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Appendix 3

id	Name	Depth A	Depth B	Depth C	Soil form	x	y
42	K42	200	1500	1500	Valsrivier	23.5155899453	-32.4299058994
43	K43	200	800	800	Swartland	23.5363222171	-32.4484588555
44	K44	200	600	600	Clovelly	23.5440377203	-32.4440569083
45	K45	200	1000	1000	Swartland	23.5511067739	-32.4400189620
46	K46	200	600	600	Swartland	23.5593141573	-32.4348235649
47	K47	200	200	200	Glenrosa	23.5695738271	-32.4359165632
48	K48	200	1500	1500	Swartland	23.5773987821	-32.4401482967
49	K49	200	200	200	Glenrosa	23.5716980160	-32.4508020051
50	K50	200	200	200	Glenrosa	23.5637433000	-32.4549449451
51	K51	200	1000	1000	Swartland	23.5547816072	-32.4557490397
53	K53	200	1500	1500	Swartland	23.5396484618	-32.4381940830
54	K54	300	300	300	Glenrosa	23.5344519470	-32.4302238494
55	K55	200	1000	1000	Addo	23.5309501190	-32.4218429958
56	K56	200	600	800	Addo	23.5263776819	-32.4115429398
57	K57	200	600	600	Addo	23.5257851916	-32.3982648161
58	K58	200	700	700	Addo	23.5292105728	-32.3848581594
59	K59	200	200	200	Glenrosa	23.6038564874	-32.5002901272
60	K60	200	200	200	Glenrosa	23.6109556085	-32.4951227667
61	K61	200	200	200	Glenrosa	23.6172192791	-32.4889245405
62	K62	200	200	200	Glenrosa	23.6213533728	-32.4789886347
63	K63	300	300	300	Glenrosa	23.6260550825	-32.4715977116
64	K64	200	200	200	Glenrosa	23.6327204591	-32.4646984490
65	K65	300	300	300	Glenrosa	23.6233046735	-32.4617066606
66	K66	200	200	200	Glenrosa	23.6249156810	-32.4535009279
67	K67	200	200	200	Glenrosa	23.6354831862	-32.4436972033
68	K68	200	900	900	Swartland	23.6125871902	-32.4567381170
69	K69	1000	1000	100	Swartland	23.6037713422	-32.4533295968
70	T70	200	200	200	Glenrosa	23.6129699950	-32.4694541930
71	T71	200	200	200	Glenrosa	23.6060270996	-32.4795638933
72	K72	200	1200	1200	Swartland	23.5985658819	-32.4861704063
73	T73	200	1000	1000	Swartland	23.5897681624	-32.4863206172
74	T74	200	1300	1300	Swartland	23.5888612901	-32.4971792010
75	T75	200	200	200	Glenrosa	23.5711796214	-32.4953040804
76	T76	200	1000	1000	Swartland	23.5763265360	-32.4786351037
77	K77	200	1000	1000	Swartland	23.5856387260	-32.4713189435
78	K78	200	1000	1000	Swartland	23.5924110021	-32.4632838921
79	K79	200	200	200	Glenrosa	23.5502960285	-32.4888517106
80	K80	200	1500	1500	Addo	23.5480560977	-32.4740739824
81	K81	200	200	200	Glenrosa	23.5575150256	-32.4878476305