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## **Agricultural Assessment Report for the proposed Bethel Solar PV Facility and Associated Infrastructure**

**Submitted by TerraAfrica Consult (Pty) Ltd**

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## Table of Contents

|                                                                    |           |
|--------------------------------------------------------------------|-----------|
| <b>1. Introduction .....</b>                                       | <b>3</b>  |
| <b>2. Project description.....</b>                                 | <b>5</b>  |
| <b>3. Purpose and objectives.....</b>                              | <b>7</b>  |
| <b>4. Legislative framework for the assessment.....</b>            | <b>7</b>  |
| <b>5. Methodology.....</b>                                         | <b>9</b>  |
| 5.1 Desktop analysis of satellite imagery.....                     | 9         |
| 5.2 Analysis of all other relevant available information .....     | 9         |
| 5.3 Site assessment.....                                           | 10        |
| 6.4 Impact Assessment Methodology .....                            | 12        |
| <b>6. Study gaps, limitations and assumptions .....</b>            | <b>13</b> |
| <b>7. Results .....</b>                                            | <b>13</b> |
| 7.1 Land type .....                                                | 13        |
| 7.1.1 Land Type Bc48.....                                          | 15        |
| 7.1.2 Land Type Bd51.....                                          | 15        |
| 7.1.3 Land Type Ca102 .....                                        | 16        |
| 7.2 Soil forms .....                                               | 16        |
| 7.3 Agricultural potential.....                                    | 19        |
| 7.4 Land capability .....                                          | 21        |
| 7.5 Agricultural land use.....                                     | 22        |
| 7.5.1 Crop production.....                                         | 22        |
| 7.5.2 Animal production .....                                      | 26        |
| <b>8. Agricultural sensitivity .....</b>                           | <b>28</b> |
| 8.1 Sensitivity according to the environmental screening tool..... | 28        |
| 8.2 Verified agricultural sensitivity .....                        | 29        |
| 8.3 Allowable development limits .....                             | 30        |
| <b>9. Impact assessment.....</b>                                   | <b>32</b> |
| 9.1 Description of project activities .....                        | 32        |
| 9.2 Rating of impact significance .....                            | 32        |
| <b>10. Cumulative impacts .....</b>                                | <b>37</b> |
| <b>12. Acceptability statement.....</b>                            | <b>41</b> |
| <b>13. Reference list .....</b>                                    | <b>42</b> |

## List of Figures

|                                                                                                                                                                                           |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Figure 1: Locality map of the Bethel Solar PV Energy Facility and the grid connection alternatives .....                                                                                  | 4  |
| Figure 2: Layout map of the Bethel Solar PV project and alternative locations of the grid connection corridor .....                                                                       | 5  |
| Figure 3: Survey points map of the Bethel PV Energy Facility project .....                                                                                                                | 11 |
| Figure 4: Land type map for the Bethel Solar PV area and grid connection alternatives .....                                                                                               | 14 |
| Figure 5: Terrain form sketch of Land Type Bc48 .....                                                                                                                                     | 15 |
| Figure 6: Terrain form sketch of Land Type Bd51 .....                                                                                                                                     | 16 |
| Figure 7: Terrain form sketch of Land Type Ca102 .....                                                                                                                                    | 16 |
| Figure 8: Soil map of the Bethel PV Facility's project area and grid connection alternatives .....                                                                                        | 17 |
| Figure 9: Agricultural potential of the Bethel PV Facility's project area and grid connection alternatives .....                                                                          | 20 |
| Figure 10: Land capability classification of the project area and grid connection alternatives (data source: DALRRD, 2016). .....                                                         | 21 |
| Figure 11: Field crop boundaries within the Bethel PV project area and grid connection alternatives (data source: DALRRD, 2019) .....                                                     | 23 |
| Figure 12: Grazing capacity of the Bethel PV project area and grid connection alternatives (data source: DALRRD, 2018). .....                                                             | 27 |
| Figure 13: Agricultural sensitivity of the screening area, inclusive of the Bethel PV project's boundary area, according to the screening report of the Environmental Screening Tool..... | 28 |
| Figure 14: Agricultural sensitivity of the screening area, inclusive of the Bethel PV project's boundary area, according to the screening report of the Environmental Screening Tool..... | 29 |
| Figure 15: Agricultural sensitivity of the Bethel PV project area and grid connection alternatives .....                                                                                  | 31 |
| Figure 16: Locality of other renewable energy projects in the area that may result in cumulative impacts .....                                                                            | 38 |

## List of Tables

|                                                                                                                                 |    |
|---------------------------------------------------------------------------------------------------------------------------------|----|
| Table 1: Soil forms present within the project area and grid connection alternatives of the Bethel PV project.....              | 18 |
| Table 2: Agricultural potential of soil within the project area and grid connection alternatives of the Bethel PV project ..... | 19 |
| Table 3: Photographic evidence of land cover/vegetation in the area delineated as a crop field by DALRRD (2019).....            | 24 |
| Table 4: Agricultural sensitivity of the project area and grid connection alternatives of the Bethel PV project.....            | 30 |
| Table 5: Calculated allowable development limits of the development footprint .....                                             | 30 |
| Table 6 Assessment of cumulative impact of decrease in areas available for farming activities .....                             | 39 |
| Table 7 Assessment of cumulative impact of areas susceptible to soil erosion .....                                              | 39 |
| Table 8 Assessment of cumulative impact of areas susceptible to soil compaction .....                                           | 40 |
| Table 9 Assessment of cumulative impact of increased risk of soil pollution .....                                               | 40 |

## 1. Introduction

The applicant Bethel Solar PV (Pty) Ltd are proposing the construction of a Solar Photovoltaic (PV) Energy Facility and associated infrastructure, known as Bethel Solar PV, on Farm 431 and the Remainder of Farm 466 located South of Louis Trichardt in the Makhado Local Municipality, Vhembe District, Limpopo Province (Figure 1). The Applicant appointed TerraAfrica Consult (Pty) to conduct the agricultural assessment as part of the Environmental Authorisation process for the PV Energy Facility.

A study site of approximately 625ha is being assessed as part of this Environmental Process and the infrastructure associated with an up to 240 Megawatt (MW) PV facility.

The proposed Bethel Solar PV Project will include the following components:

- Solar Field
- Associated Infrastructure such as access roads, fencing and O&M buildings
- Project IPP Substation
- AC coupled BESS installation at project substation and laydown area

This environmental application process includes Electrical Grid Connection Infrastructure required to connect the Bethel Solar PV to the National Grid via the existing Tabor Main Transmission Substation (MTS). Three Grid connection alternatives are under investigation as part of this environmental process. Different land portions are affected by the various grid connection alternatives.

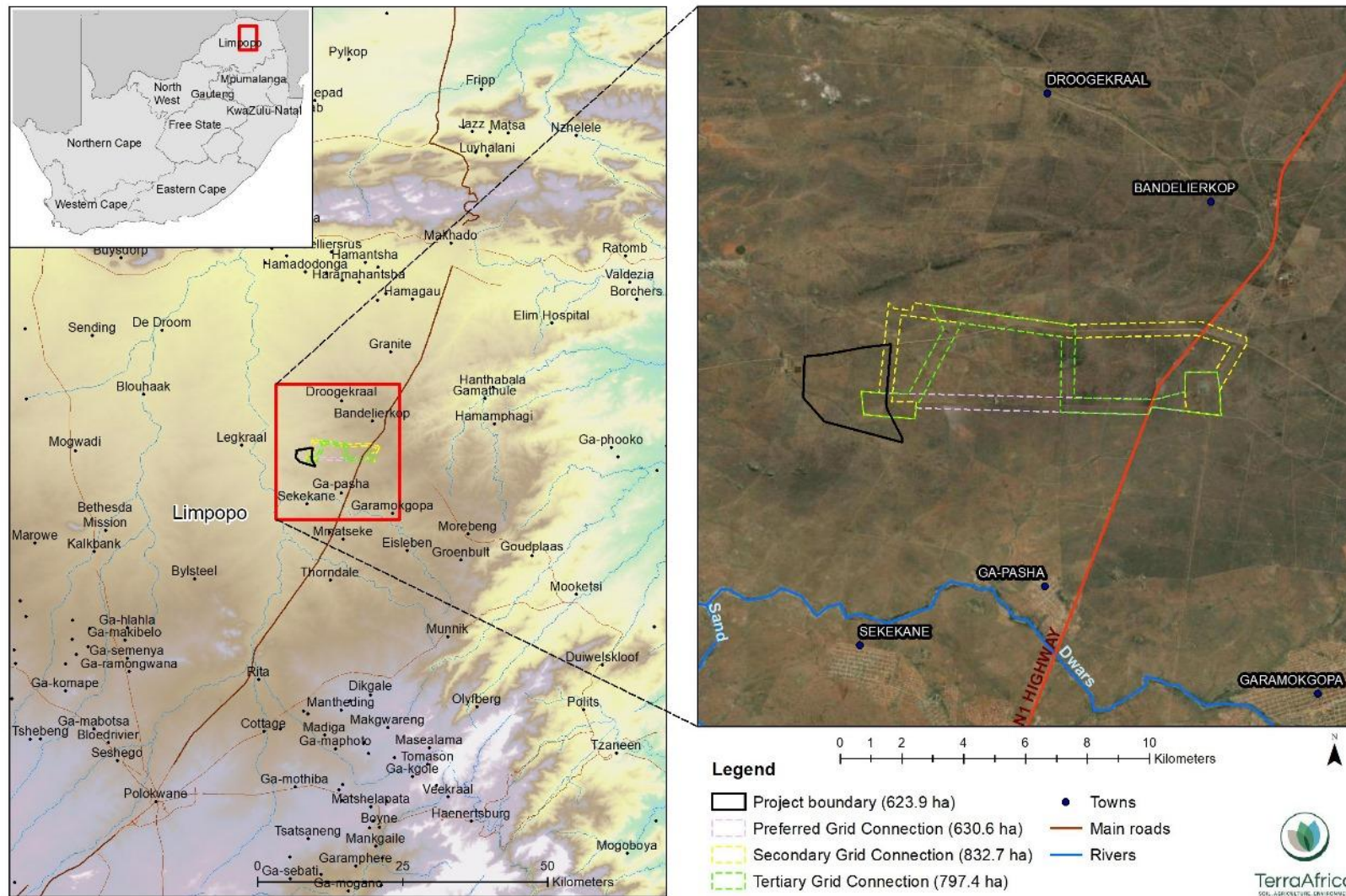


Figure 1: Locality map of the Bethel Solar PV Energy Facility and the grid connection alternatives

## 2. Project description

The proposed layout of the Bethel Solar PV Energy Facility and the locality of the grid connection alternatives are shown in Figure 2.



Figure 2: Layout map of the Bethel Solar PV project and alternative locations of the grid connection corridor

The different components of the Bethel Solar PV Project will consist of:

- Solar Field
  - Solar Arrays: PV modules;
  - Single axis tracking technology maximum height of 5m (aligned north-south);
  - Solar module mounting structures comprised of galvanised steel and aluminium;
  - Foundations which will likely be drilled and concreted into the ground;
  - Solar measurement and weather stations;
  - Central/string Inverters and MV transformers in in field;
  - DC coupled Battery Energy Storage system (BESS) containers distributed through PV field located adjacent to inverters ;
    - Lithium Ion battery Cells, Modules, Racks and containers.
    - Power Conversion Equipment.
    - Battery Management System.
    - Energy Management System.
- Associated Infrastructure
  - Medium Voltage (MV =22/33 kV) overhead powerlines and underground cables;
  - MV Collector stations;
  - Access road;
  - Internal gravel roads;
  - Fencing;
  - General maintenance area;
  - Storm water channels and berms;
  - Water storage tanks and pipelines;
  - Temporary work area during the construction phase (i.e. laydown area) (up to 7ha);
  - O&M buildings (up to 1ha);
  - Storerooms;
  - Diesel storage area (up to 0.25ha).
- Project IPP Substation (up to 1ha);
  - 132kV substation;
  - HV transformer;
  - Substation Control Building;
  - HV metering, Scada and protection building;
  - MV collector switchgear buildings;
  - Compensation equipment (Filters capacitors reactors statcoms).
- AC coupled BESS installation at project substation and laydown area (up to 6ha):
  - Solid Sate Battery technology - either Lithium-Ion or Sodium Sulphide (NaS)
    - Battery Cells, Modules, Racks and containers;
    - Power Conversion Equipment;
    - Battery Management System;
    - Energy Management System;
    - MV transformers;
    - MV cabling and collector stations;

- Fencing;
- Offices, workshop;
- Fire Protection systems.

The Electrical Grid Infrastructure includes:

- Onsite Switching Station (SS) (up to 1ha), adjacent to the IPP Substation.
- 132kV Overhead Power Line (OHPL) – 30m height from the switching station to the existing Eskom Tabor Substation;
- Access Road to Switching Station;
- Maintenance access road below or adjacent to the power line.

### **3. Purpose and objectives**

The overarching purpose of the agricultural assessment is to ensure that the site's sensitivity to agricultural production from the proposed project activities is sufficiently considered. Also, 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 study area and 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 Environmental Assessment Report (prepared in accordance with the NEMA regulations) for the proposed PV facility.

### **4. Legislative framework for the assessment**

The report follows the protocols as stipulated for agricultural assessment 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.

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 must 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:

| <b>GNR 320 requirements of an Agricultural Compliance Statement (Low to Medium Sensitivity)</b>                                                                                                                                                                                                  | <b>Reference in this report</b> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| 3.1. The compliance statement must be prepared by a soil scientist or agricultural specialist registered with the SACNASP.                                                                                                                                                                       | Appendix 2, and 3               |
| 3.2. The compliance statement must:                                                                                                                                                                                                                                                              | Section 7                       |
| 3.2.1. be applicable to the preferred site and proposed development footprint;                                                                                                                                                                                                                   |                                 |
| 3.2.2. confirm that the site is of "low" or "medium" sensitivity for agriculture; and                                                                                                                                                                                                            | Section 8                       |
| 3.2.3. indicate whether the proposed development will have an unacceptable impact on the agricultural production capability of the site.                                                                                                                                                         | Section 11                      |
| 3.3. The compliance statement must contain, as a minimum, the following information:                                                                                                                                                                                                             | Appendix 2, 3 and 4             |
| 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;                                                                                                |                                 |
| 3.3.2. a signed statement of independence;                                                                                                                                                                                                                                                       | Appendix 2                      |
| 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;                                                                            | Figures 14 and 15               |
| 3.3.4 calculations of the physical development footprint area for each land parcel as well as the total physical development footprint area of the proposed development including supporting infrastructure;                                                                                     | Section 1                       |
| 3.3.5 confirmation that the development footprint is in line with the allowable development limits                                                                                                                                                                                               | Section 8.3                     |
| 3.3.6. 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                      |
| 3.3.7. a substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not, of the proposed development;                                                                         | Section 12                      |
| 3.3.8. any conditions to which the statement is subjected;                                                                                                                                                                                                                                       | Section 12                      |
| 3.3.9. in the case of a linear activity, confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase; | Sections 7.5.2 and 12           |
| 3.3.10. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMP; and                                                                                                                                                                         | Section 10                      |

|                                                                                                                                           |                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 3.3.11. a description of the assumptions made as well as any uncertainties or gaps in knowledge or data.                                  | Section 6                                                          |
| 3.4. A signed copy of the 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 |

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.

## 5. 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.

### 5.1 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.

### 5.2 Analysis of all other relevant available information

The proposed development area was also superimposed on five different raster data sets for the desktop analysis of the proposed project area. The data sets are:

- Land type data was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 – 2006). The data is presented at a scale of 1:250 000 and entails dividing land into land types, presenting typical terrain cross sections for each type, and identifying dominant soil types for each identified terrain unit.
- The Refined Land Capability Evaluation Radar Data for South Africa was developed using a spatial evaluation modelling approach (DALRRD, 2016).
- The long-term grazing capacity for South Africa 2018 presents the long-term grazing capacity of an area assuming the veld is in relatively good condition (South Africa, 2018).
- The Limpopo Province Field Crop Boundaries show crop production areas may be present within the affected properties. The field crop boundaries include rainfed annual crops, non-pivot and pivot irrigated annual crops, horticulture, viticulture, old fields, small holdings, and subsistence farming (DALRRD, 2019).
- The Protected Agricultural Areas for Cultivation (Limpopo Province) (2019) show the areas within the province regarded as having high agricultural potential and capability to contribute to food production in both the province and the country (DALRRD, 2019).

### 5.3 Site assessment

The site visit was done from 4 until 10 December 2024. The soil was classified on a reconnaissance-level grid with survey points about 400 m apart. The survey points were logged on-site with a handheld Garmin GPS. During the site visit, a larger area was assessed that includes the Bethel Solar PV facility's project boundary and grid connection alternatives. All the survey points assessed during the site visit are shown in Figure 3, in relation to the project boundary and grid connection alternatives of the Bethel PV facility. The data recorded at each survey point is presented in Appendix 1. Photographic evidence of the soil properties and current land uses of the assessment area was collected at each survey point.

The data recorded at each survey point include soil form, colour of the topsoil and subsoil horizons, clay content of the respective horizons, nature of the depth-limiting material, and current land use at the specific point. A 10% hydrochloric acid solution was used to test for the presence of carbonates in the profiles.

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.

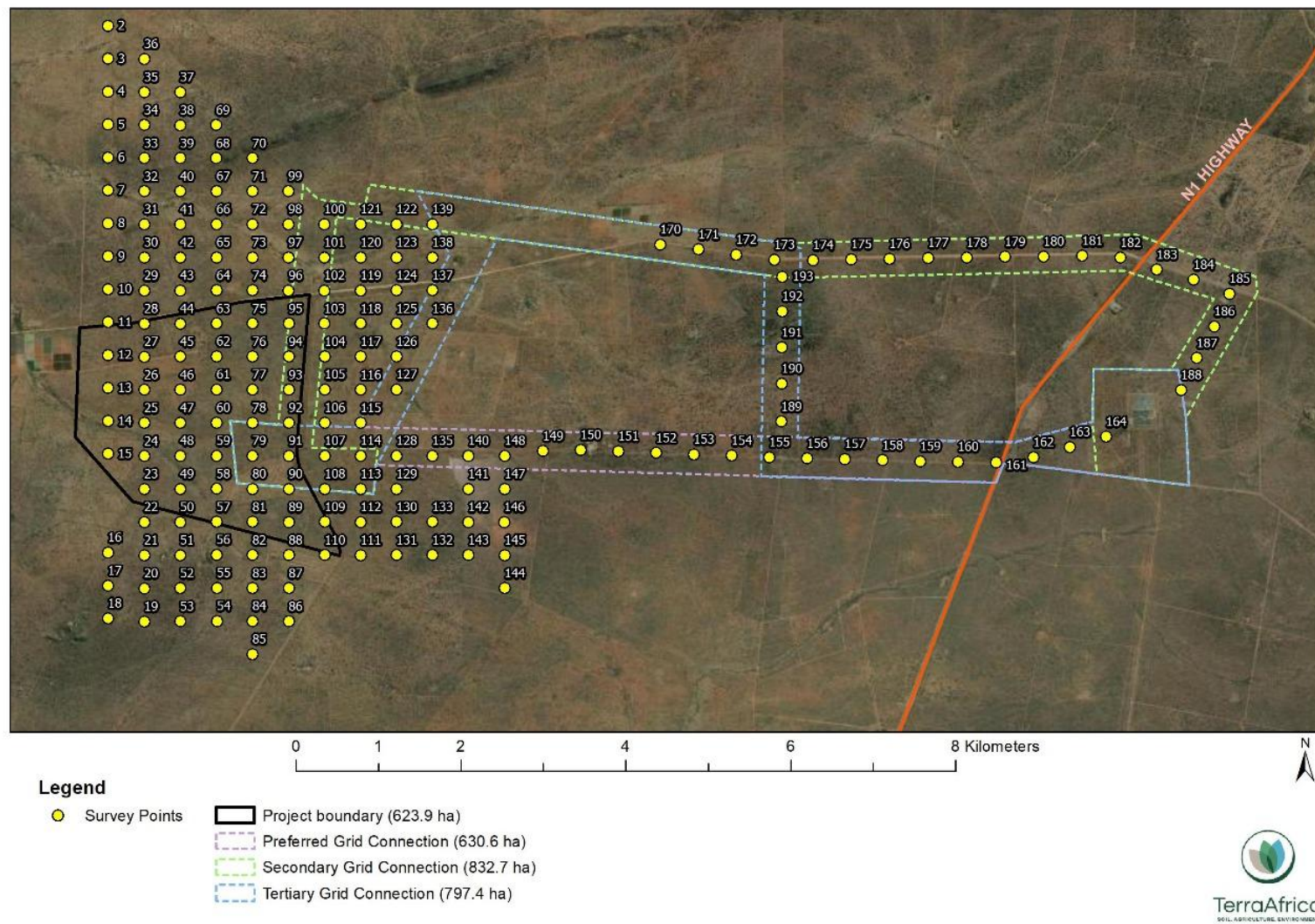


Figure 3: Survey points map of the Bethel PV Energy Facility project

## 6.4 Impact Assessment Methodology

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).

## 6. Study gaps, limitations and assumptions

Site visit access was unavailable in two areas of the proposed grid connection corridors. However, the analysis of desktop data, in addition to the site data gathered, is considered sufficient to analyse the sensitivity of these areas.

No other uncertainties and gaps have been identified that may affect the conclusions made in this report.

## 7. Results

### 7.1 Land type

The project area consists mainly of Land Type Bc48, with a smaller area along the eastern boundary consisting of Land Type Bd51 (see Figure 4). The western part of all three grid connection alternatives consists of Land type Bd51, which changes into Land Type Bc48 in the eastern parts of the grid connection alternatives. The only other land type present within the area is Land Type Ca102, which is present in the far northeastern corner of the Secondary Grid Connection Alternative.

A detailed description of each land type and the geology associated with it, follows Figure 4.

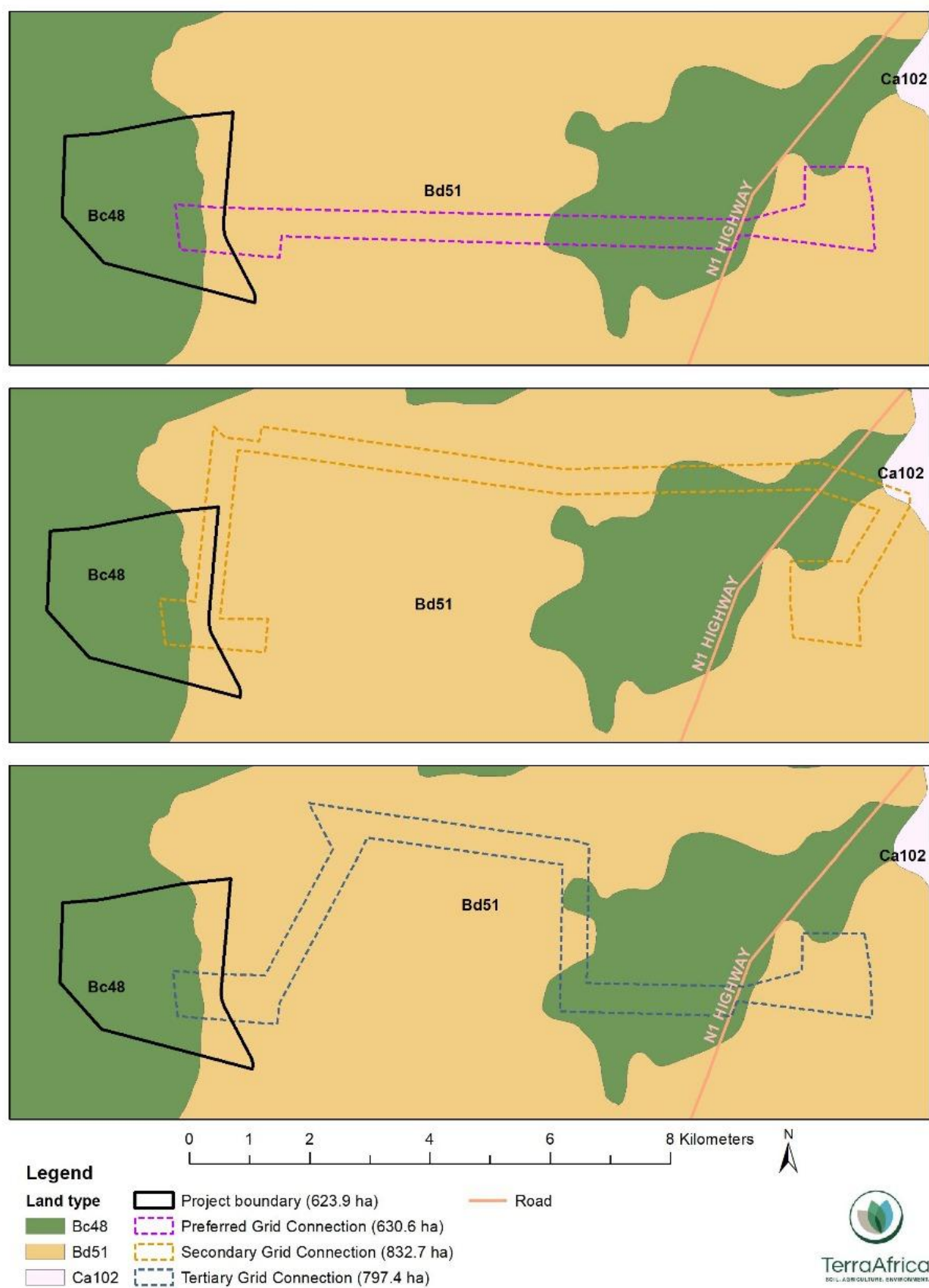


Figure 4: Land type map for the Bethel Solar PV area and grid connection alternatives

### 7.1.1 Land Type Bc48

Approximately 47% of the total area consisting of this land type, are long flat toe-slopes (Terrain unit 4) with slopes ranging between 1 to 3% and slope lengths of 400 to 2000 m. These areas comprise of red and yellow-brown apedal soil forms shallower than 1000 mm. It also includes about 20% Glenrosa soils and lesser occurrence of Mispah soil.

Both the mid-slopes (Terrain unit 3) and crests (Terrain unit 1) consists of approximately 50% Glenrosa and red apedal soils shallower than 800 mm. The slope of the crests is 1 to 2% and that of the mid-slopes range between 1 and 5%. The mid-slopes have short slope length of 50 to 300 m and that of the crests are 200 to 800 m. The landscape depressions or valley bottoms (Terrain unit 5) consist of a combination of Oakleaf, Clovelly, Pinedene, Avalon and Mispah soil. The valley bottoms have short slope length of 100 to 300 m and slope of 2 to 4%. The typical terrain form and elevation of Land Type Bc48 are illustrated in Figure 5.

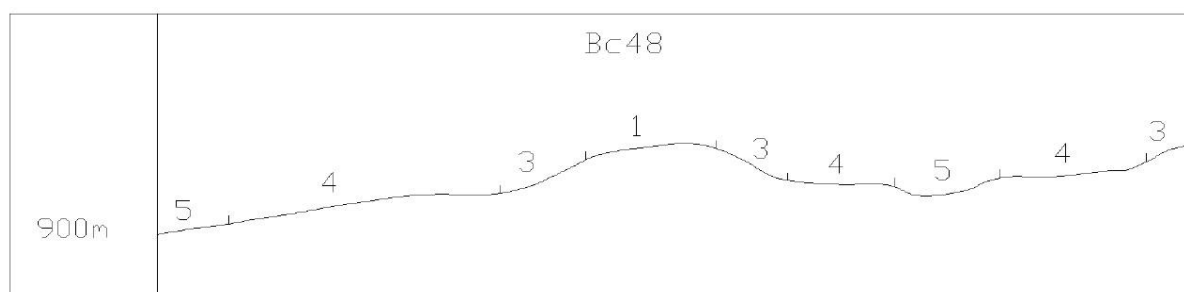


Figure 5: Terrain form sketch of Land Type Bc48

The land type data indicates the underlying geology of this land type as leucocratic migmatite and gneiss, grey and pink hornblende-biotite gneiss, grey biotite gneiss and minor muscovite-bearing granite, pegmatite and gneiss of the Hout River Gneiss Formation. There is also metapelite of the Banderlierkop Complex.

### 7.1.2 Land Type Bd51

Land Type Bd51 represent a slightly undulating landscape where the valley bottoms have slightly higher elevation (920 masl) in contrast to that of Land Type Bc48 (900 masl). Land Type Bd51 also consist of only three terrain units and do not have mid-slope positions. The typical terrain form and elevation of Land Type Bd51 are illustrated in Figure 6.

Approximately 60% of the total area consists of long, flat toe-slopes (Terrain unit 4), with slopes ranging from 0% to 2% and slope lengths of 400 to 3000 m. These areas comprise of red and yellow-brown apedal soil forms shallower than 1000 mm. It also includes Glenrosa soils and a lesser occurrence of Oakleaf, Longlands, Mispah and Westleigh soil forms. The rest of the land type area consists of 20% crests (Terrain unit 1) and 20% valley bottoms (Terrain unit 5). The slope of both the crests and valley bottoms range between 0 and 2% and the slope length is 200 to 500 m. The crests and valley bottoms consist of a similar combination of soil forms to that of the toe-slopes, except for the Longlands and Bainsvlei forms that are not found in crest positions.

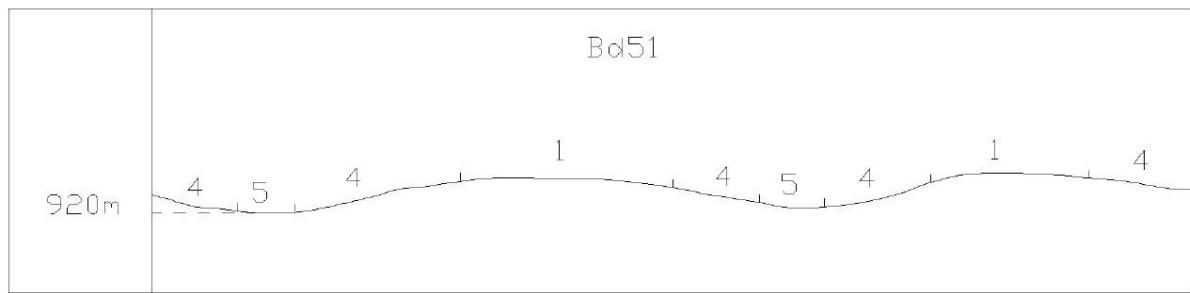


Figure 6: Terrain form sketch of Land Type Bd51

The land type data indicate the underlying geology of Land Type Bd51 as leucocratic migmatite and gneiss, grey and pink hornblende-biotite gneiss, grey biotite gneiss, and minor muscovite-bearing granite, pegmatite, and gneiss of the Hout River Gneiss Formation. There is also sand and alluvium of the Quaternary System.

### 7.1.3 Land Type Ca102

Land Type Ca102 represents a flat to slightly undulating landscape consisting of 30% mid-slopes (Terrain unit 3), 40% toe-slopes (Terrain unit 4) and 30% valley bottoms (Terrain unit 5). The slope of all terrain units ranges between 0 and 5% and the slope lengths range between 300 and 3000 m. The typical terrain form of Land Type Ca102 is illustrated in Figure 7. The mid-slopes consist of approximately 65% red apedal soils between 400 and 750 mm deep and about 14% duplex soil of the Swartland form. The valley bottoms and toe-slopes consist of the same soil forms, but also include soil from the Valsrivier, Oakleaf, Westleigh, and Pinedene forms. The underlying geology consists of dark grey to light grey biotite-hornblende gneiss, sand banded gneiss of the Goudplaats Gneiss. It also includes metapelite, amphibolite, mafic granulite of the Bandelierskop Complex.

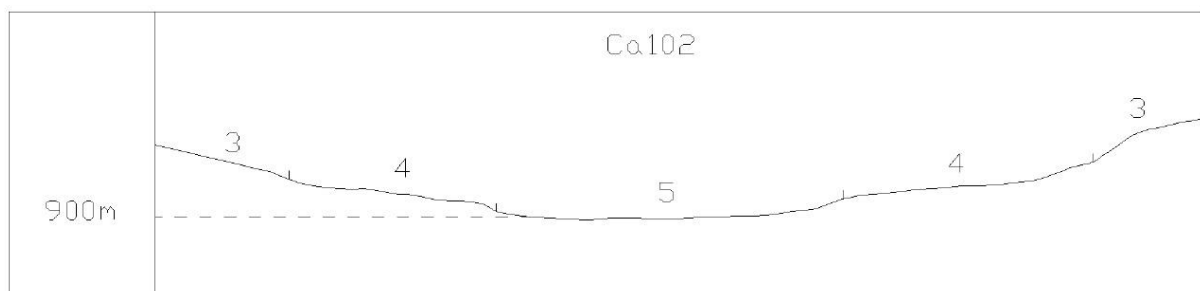


Figure 7: Terrain form sketch of Land Type Ca102

## 7.2 Soil forms

Fifteen different soil forms were classified within the Bethel PV Energy Facility's project area and grid connection alternatives. Nine of these soil forms are present in both the project area and the grid connection alternatives, while the other six forms are only present in the grid connection alternatives. The position of the soil forms within the study area, is shown in Figure 8 and the area of each soil form within the project boundary and grid connection alternatives is shown in Table 1.

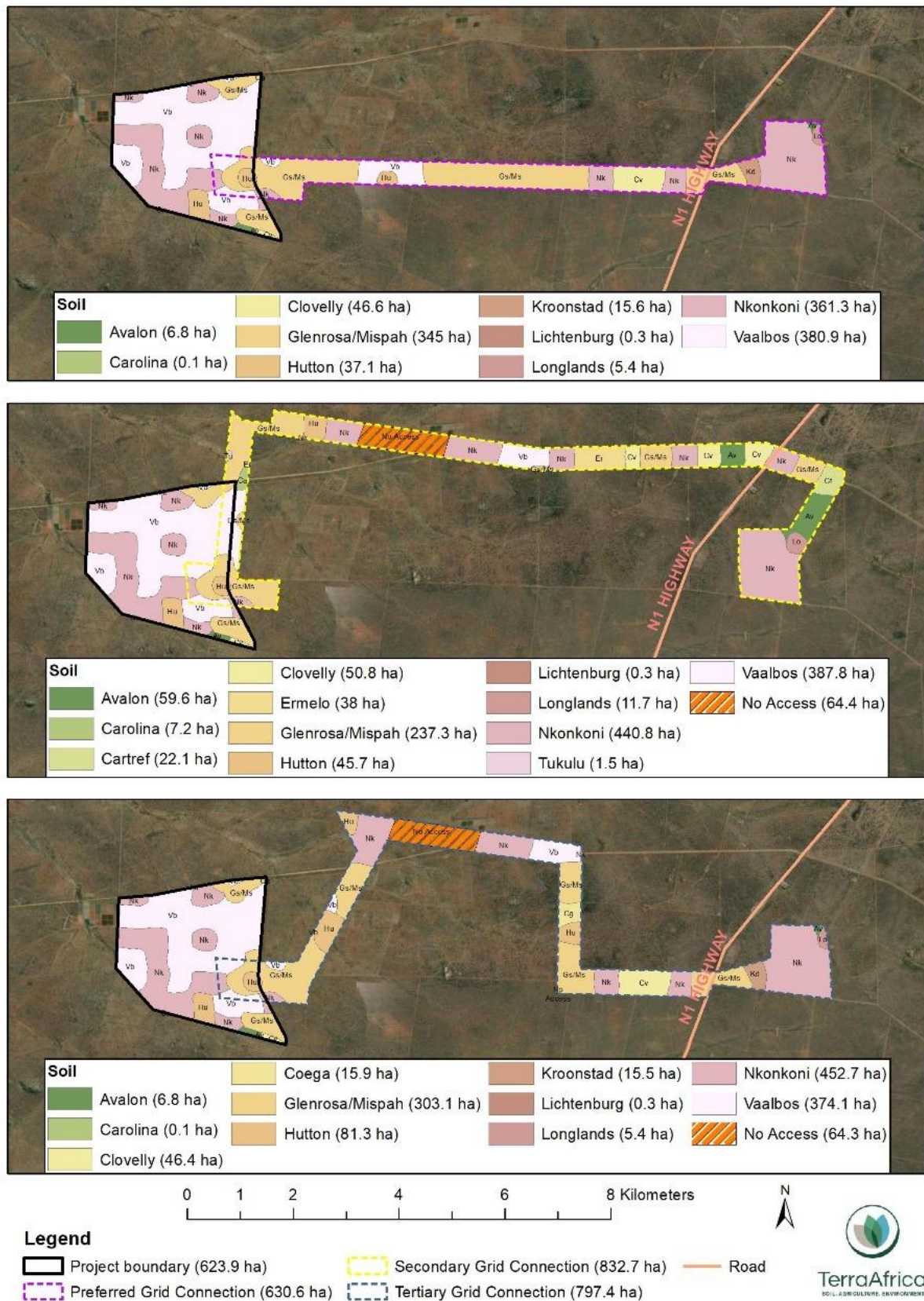


Figure 8: Soil map of the Bethel PV Facility's project area and grid connection alternatives

Table 1: Soil forms present within the project area and grid connection alternatives of the Bethel PV project

| Soil form       | Project area (ha) | Preferred grid connection (ha) | Secondary grid connection (ha) | Tertiary grid connection (ha) |
|-----------------|-------------------|--------------------------------|--------------------------------|-------------------------------|
| Avalon          | 4.5               | 2.3                            | 55.1                           | 2.3                           |
| Carolina        | 0.1               | -                              | 7.1                            | -                             |
| Cartref         | -                 | -                              | 22.1                           | -                             |
| Clovelly        | 3.6               | 43                             | 47.2                           | 42.8                          |
| Coega           | -                 | -                              | -                              | 15.9                          |
| Ermelo          | -                 | -                              | 38                             | -                             |
| Glenrosa/Mispah | 73.1              | -                              | 164.2                          | 230                           |
| Hutton          | 28.4              | 8.7                            | 17.3                           | 52.9                          |
| Kroonstad       | -                 | 15.6                           | -                              | 15.5                          |
| Lichtenburg     | 0.3               | -                              | -                              | -                             |
| Longlands       | -                 | 5.4                            | 11.7                           | 5.4                           |
| Nkonkoni        | 182.7             | 361.3                          | 258.1                          | 270                           |
| Tukulu          | -                 | -                              | 1.5                            | -                             |
| Vaalbos         | 331.2             | 49.7                           | 56.6                           | 42.9                          |

The dominant soil forms within the project area are Vaalbos (about 331.2 ha) and Nkonkoni (about 182.7 ha). Both the Vaalbos and Nkonkoni soil forms consist of orthic topsoil and red apedal subsoil. In the case of the Vaalbos soil, the red apedal subsoil is limited in depth by hard rock (either solid or fractured) while the Nkonkoni soil is limited in depth by lithic material. Other soil forms dominated by red apedal subsoil in the project area include that of the Hutton soil form (28.4 ha) that is 1.5 m or deeper and the Lichtenburg soil form (0.3 ha) where depth is restricted by a hard plinthic horizon.

The Glenrosa and Mispah soil forms were grouped together for the soil map, as both consist of shallow orthic topsoils that overlay solid rock or lithic material. The two lithic soil forms, Mispah and Glenrosa, are present at 73.1 ha of the project area. These soils consist of orthic topsoil that is between 100 and 400 mm deep and restricted in depth by either lithic material (Glenrosa) or fractured and/or solid rock (Mispah). The other soil forms within the project area consist of orthic topsoil with yellow-brown apedal subsoil that covers different depth-limiting materials. These soils are the Avalon form (4.5 ha), characterised by a soft plinthic horizon underneath, and the Carolina form (0.12 ha), which is limited in depth by hard rock.

The soil forms present in the project area are also present in the grid connection alternative corridors. In addition to these soil forms, there are other soil forms such as the Ermelo form, where the yellow-brown apedal horizon reaches up to 1.5m deep or deeper. Other soil forms include three forms where orthic topsoil overlies bleached albic subsoil: the Cartref, Kroonstad and the Longlands forms. The Cartref form is limited in depth by lithic material, the Kroonstad form by a gley horizon and the Longlands form has soft plinthic material underneath the albic subsoil. There is also an area of Coega soil where orthic topsoil overlies a hard carbonate horizon. The Tukulu soil, only present in the Secondary Grid Connection alternative, consists of orthic topsoil, neocutanic subsoil that is limited in depth by gleyic materials.

An area of about 64 ha, present within the Secondary and Tertiary grid connection alternatives, was inaccessible during the site visit. It is highly likely that this area consists of one or more of the soil forms identified within the rest of the grid connection corridors.

### 7.3 Agricultural potential

The agricultural potential of the different soil forms was determined using expert knowledge of the soil forms present, their effective soil depth, water-holding capacity, and terrain capabilities. The soils within the Bethel PV project area and grid connection alternatives can either be classified as Moderate, Low-Moderate or Low agricultural potential.

The most significant part of project boundary area where the PV arrays will be located, has Low agricultural potential (about 549.2 ha) while the areas with Low-Moderate agricultural potential in the project area measures 41.9 ha and that with Moderate agricultural, about 32.8 ha.

The total area of each agricultural potential class within the project boundary as well as the individual grid connection alternative corridors, are summarised in Table 2. The position of the different agricultural potential classes in relation to the Bethel PV project's boundary area and the grid connection alternatives, are depicted in Figure 9.

Table 2: Agricultural potential of soil within the project area and grid connection alternatives of the Bethel PV project

| Agricultural potential | Project area (ha) | Preferred grid connection (ha) | Secondary grid connection (ha) | Tertiary grid connection (ha) |
|------------------------|-------------------|--------------------------------|--------------------------------|-------------------------------|
| Moderate               | 32.8              | 11.1                           | 145.6                          | 88.5                          |
| Low-Moderate           | 41.9              | 266.5                          | 312.4                          | 312.8                         |
| Low                    | 549.2             | 297.7                          | 220.9                          | 276.4                         |

The soil forms with Moderate agricultural potential are Tukulu, Hutton, Avalon, Ermelo and Vaalbos soil deeper than 1000 mm. While all these soils are deeper than 1000mm, the hot, drier climate reduces the suitability of the soils for rainfed crop production. The soil with Low-Moderate agricultural potential is those of the Clovelly, Carolina, Lichtenburg forms and the Vaalbos and Nkonkoni soils between 600 and 1000 mm deep. The agricultural potential of these soils are lower than that of the soils with Moderate potential because of less effective soil depth.

Soil forms with Low agricultural potential are that of the Cartref, Coega, Glenrosa/Mispah, Katspruit, Kroonstad and Longlands soil forms. The Cartref, Coega, Glenrosa and Mispah soil have very limited effective soil depth and therefore also limited water-holding capacity. The Katspruit, Kroonstad and Longlands soils have depth-limiting horizons at shallow depths that consist of soft plinthite and gley that retains moisture and can result in short periods of depleted oxygen in the profile, which are not suitable for crop roots.

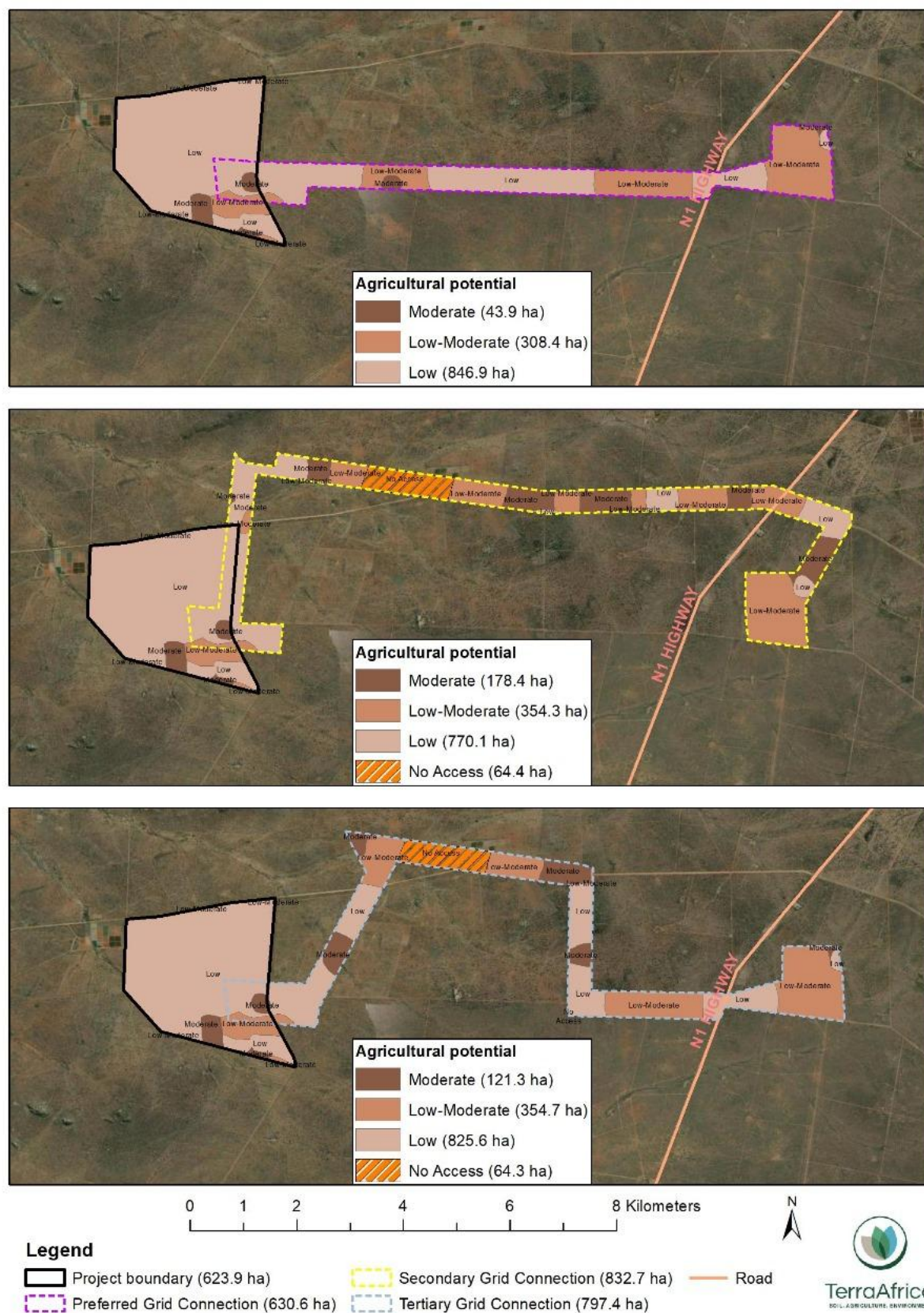


Figure 9: Agricultural potential of the Bethel PV Facility's project area and grid connection alternatives

## 7.4 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 overlaying the project boundary and grid connection alternatives on the land capability raster data (DALRRD, 2016) (see Figure 10).

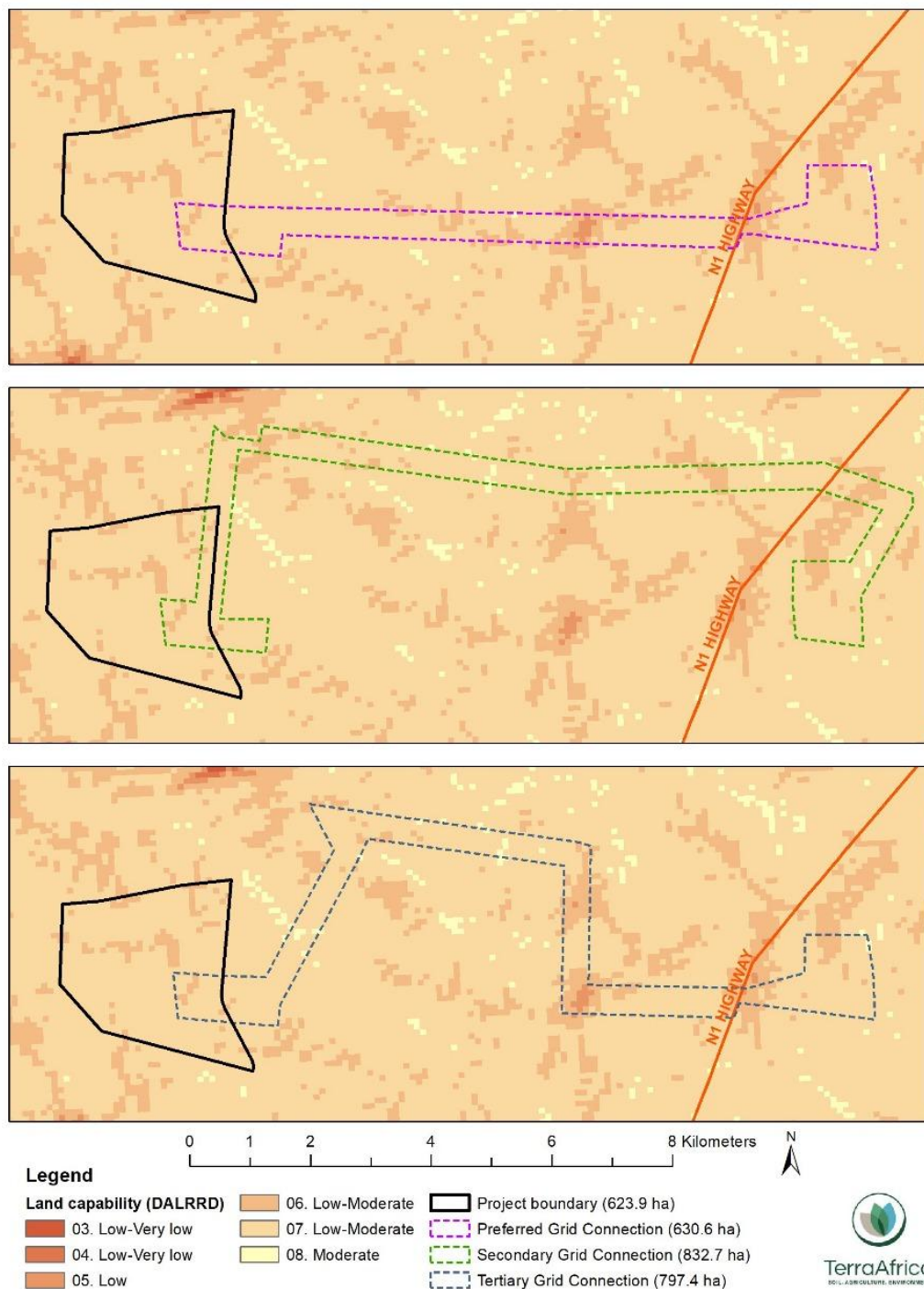


Figure 10: Land capability classification of the project area and grid connection alternatives (data source: DALRRD, 2016).

Following the raster data of DALRRD (DALRRD, 2016), the project area and all three grid connection alternatives consist mainly of land with Class 07 (Low-Moderate) land capability. Small, scattered areas consist either of land with slightly lower land capability (Classes 05 and 06) or somewhat higher land capability (Class 08). The project area and grid connection alternatives' land capability classification largely agrees with the agricultural potential verified by the soil survey.

## **7.5 Agricultural land use**

### **7.5.1 Crop production**

The field crop boundary map (see Figure 11) shows that three old fields are present within the project boundary (DALRRD, 2019). One is located along the western boundary, and another is approximately 700 m south of the northern boundary, directly east of the lower part of the eastern boundary. There is also an old field in the mid-section of both the Secondary and Tertiary Grid Connection alternatives.

During the site visit, it was confirmed that there is no rainfed crop production within the project boundary area or the grid connection corridor alternatives. Even if there were old fields, these are now covered in natural vegetation used for a combination of game and livestock farming, as confirmed during the Site Sensitivity Verification visit. The photographic evidence of selected survey points within the crop field boundaries delineated as old fields within the project boundary area, is presented in Table 3. The survey points that show the land use of the delineated old fields, are 15, 26, 45, 46, 80 and 90.

According to DALRRD (2019), there is a centre pivot that overlaps with a field of rainfed annual crops or planted pastures, just west of the northern part of the western boundary of the project boundary (refer to Figure 11). This area is outside of the area investigated during the Site Sensitivity Verification visit.

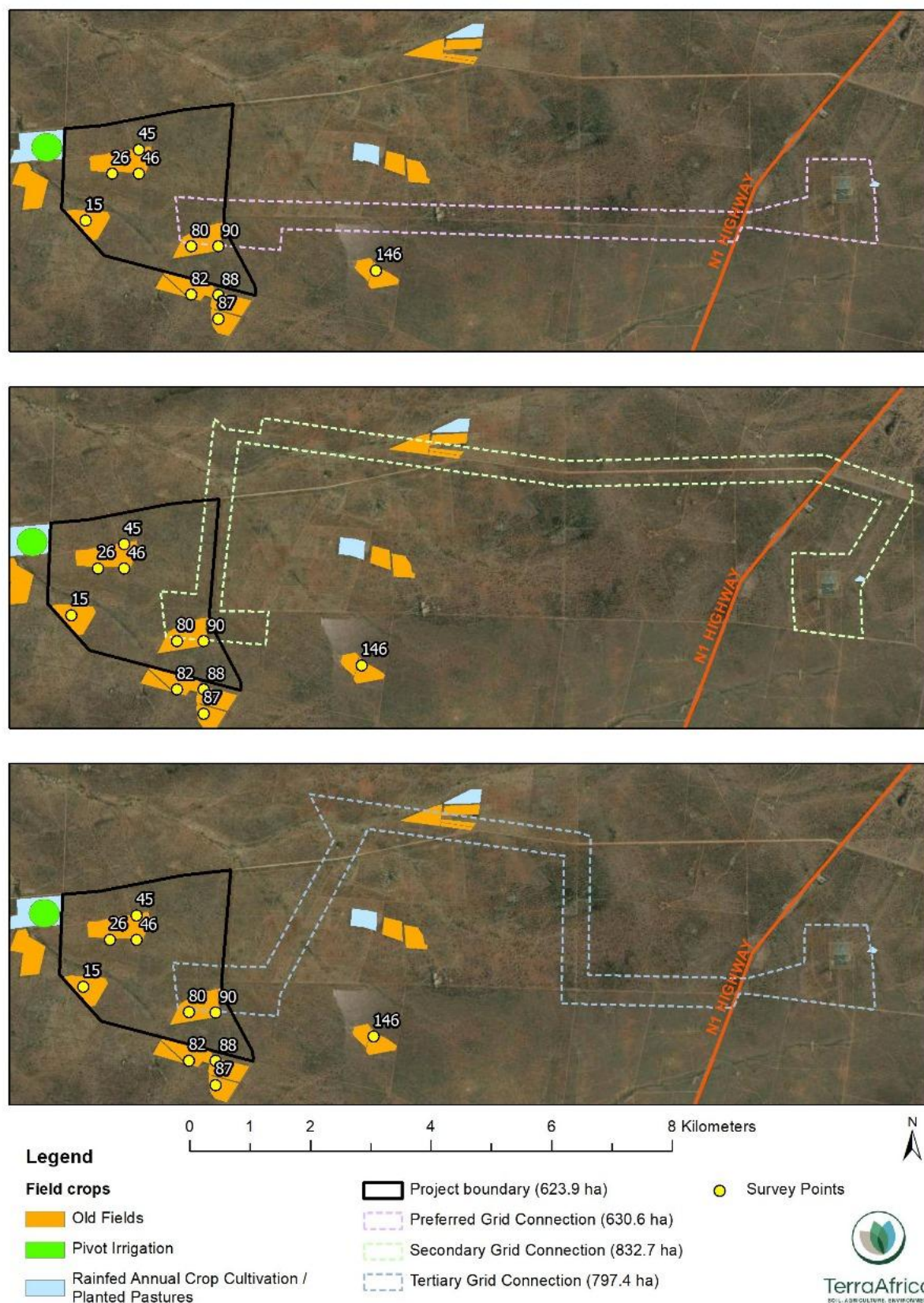


Figure 11: Field crop boundaries within the Bethel PV project area and grid connection alternatives (data source: DALRRD, 2019)

Table 3: Photographic evidence of land cover/vegetation in the area delineated as a crop field by DALRRD (2019)

| Survey point number | Photographic evidence                                                                | Land cover |
|---------------------|--------------------------------------------------------------------------------------|------------|
| 15                  |    | Veld       |
| 26                  |   | Veld       |
| 45                  |  | Veld       |

|    |                                                                                      |      |
|----|--------------------------------------------------------------------------------------|------|
| 46 |    | Veld |
| 80 |   | Veld |
| 90 |  | Veld |

### 7.5.2 Animal production

The entire project area is currently used for animal production, and a combination of game animals and livestock was observed during the site visit. Animal watering facilities are also present in the study area. Farm Portion 431 includes an accommodation facility, Makoppa Game Farm, which hunters can utilise during the hunting season.

Following the metadata layer obtained from DALRRD, the grazing capacity of the project area and grid connection alternatives is 9 ha/LSU (refer to **Error! Reference source not found.**). However, it may be an overestimation of the area's grazing capacity, as sparse vegetation indicates that less forage is available than indicated in the long-term grazing capacity of DALRRD (2018).

The project boundary area, where solar panels will be located, will temporarily be fenced off and won't be available for grazing for the life of the project. At a long-term grazing capacity of 9 ha/LSU, the forage within the project boundary can feed **69 Large Stock Units**. This forage will no longer be available for livestock or game farming once construction of the Bethel PV project commences.

The grid connection corridors are not expected to significantly impact the area's grazing capacity and, thereby, livestock and game farming. While construction of the OHL will result in temporary impacts on the soil and grazing capacity of the chosen alternative grid connection corridor, if mitigation and remedial measures are rigorously implemented, the land can be returned to the current state within two years of completion of the construction phase and animals will be able to graze in the grid corridor.

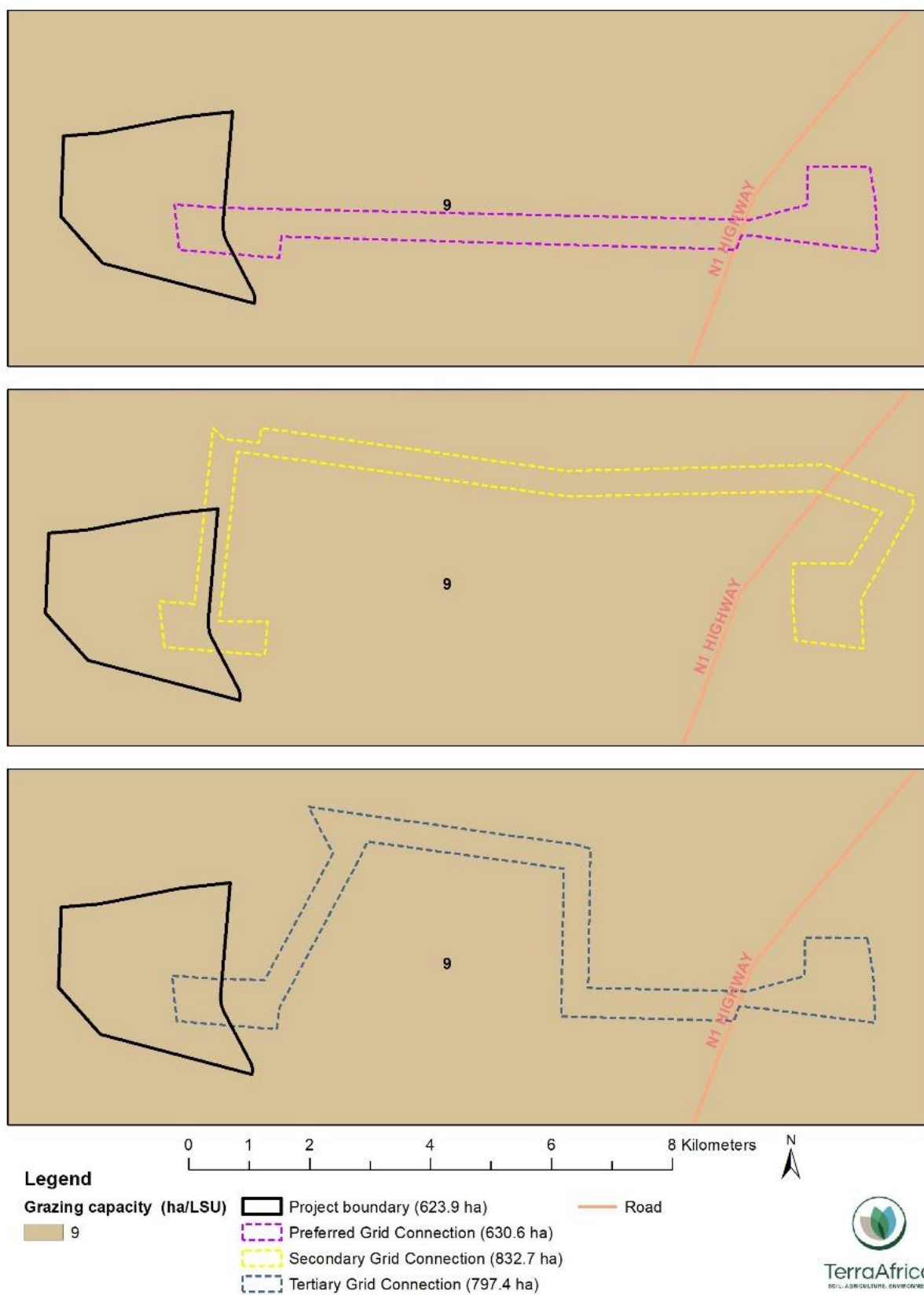


Figure 12: Grazing capacity of the Bethel PV project area and grid connection alternatives (data source: DALRRD, 2018).

## 8. Agricultural sensitivity

### 8.1 Sensitivity according to the environmental screening tool

Cape EAPrac generated a screening report for the entire screening area that was surveyed during the Site Sensitivity Verification visit. This area is inclusive of the Bethel PV project's boundary area and also show a buffered area that far exceeds 50 m. A separate screening report was created for the grid connection alternatives, also inclusive of the grid connection alternatives considered for the Bethel PV project's grid corridor. The screening report for the PV area was generated on 2 May 2024, and one for the proposed grid connection corridor options on 8 August 2024. The agricultural sensitivity map of the PV screening area is shown in Figure 14 and the one for the grid connection corridor alternatives in Figure 14.

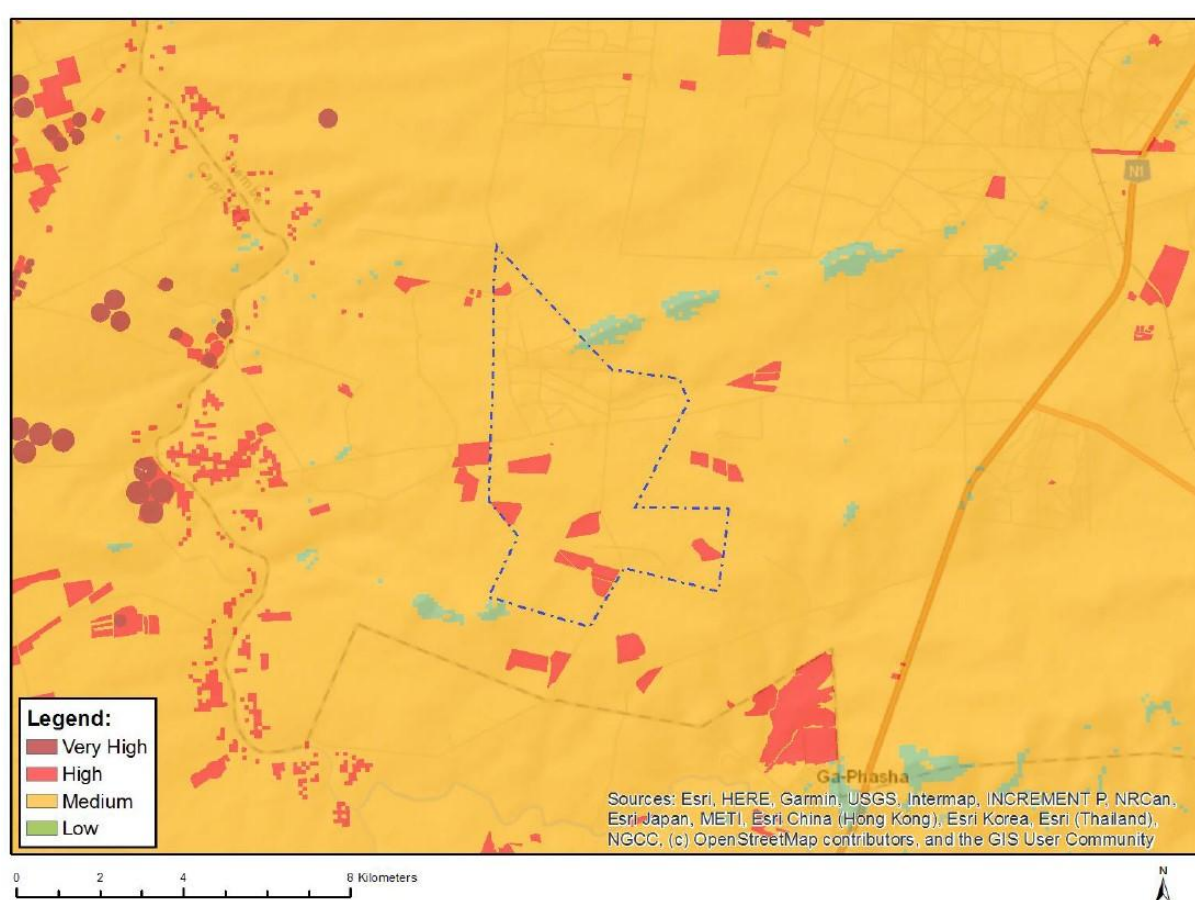


Figure 13: Agricultural sensitivity of the screening area, inclusive of the Bethel PV project's boundary area, according to the screening report of the Environmental Screening Tool

According to the screening tool, the Tabor Cluster PV screening area consists predominantly of land with Medium sensitivity. The Medium sensitivity was assigned because the land capability classification rates the area as having Low-Moderate (Class 07) land capability (DALRRD, 2016) (see Figure 10). A few scattered blocks within the area are rated as having High agricultural sensitivity. The high sensitivity was assigned to areas that have been marked as field crop boundaries because old fields likely existed here (DALRRD, 2019) (see Figure 11).

For the screening area considered for the grid connection options, a similar agricultural sensitivity is seen as for the PV area. Again, Medium sensitivity was assigned because the land capability classification rates the area as having Low-Moderate (Class 07) land capability (DALRRD, 2016) (see Figure 10). In the middle of the western part of the grid connection area, three blocks are shown as having High agricultural sensitivity because of old crop fields that may have existed here (DALRRD, 2019). A small block with Low agricultural sensitivity is shown near the southeastern corner of the area.

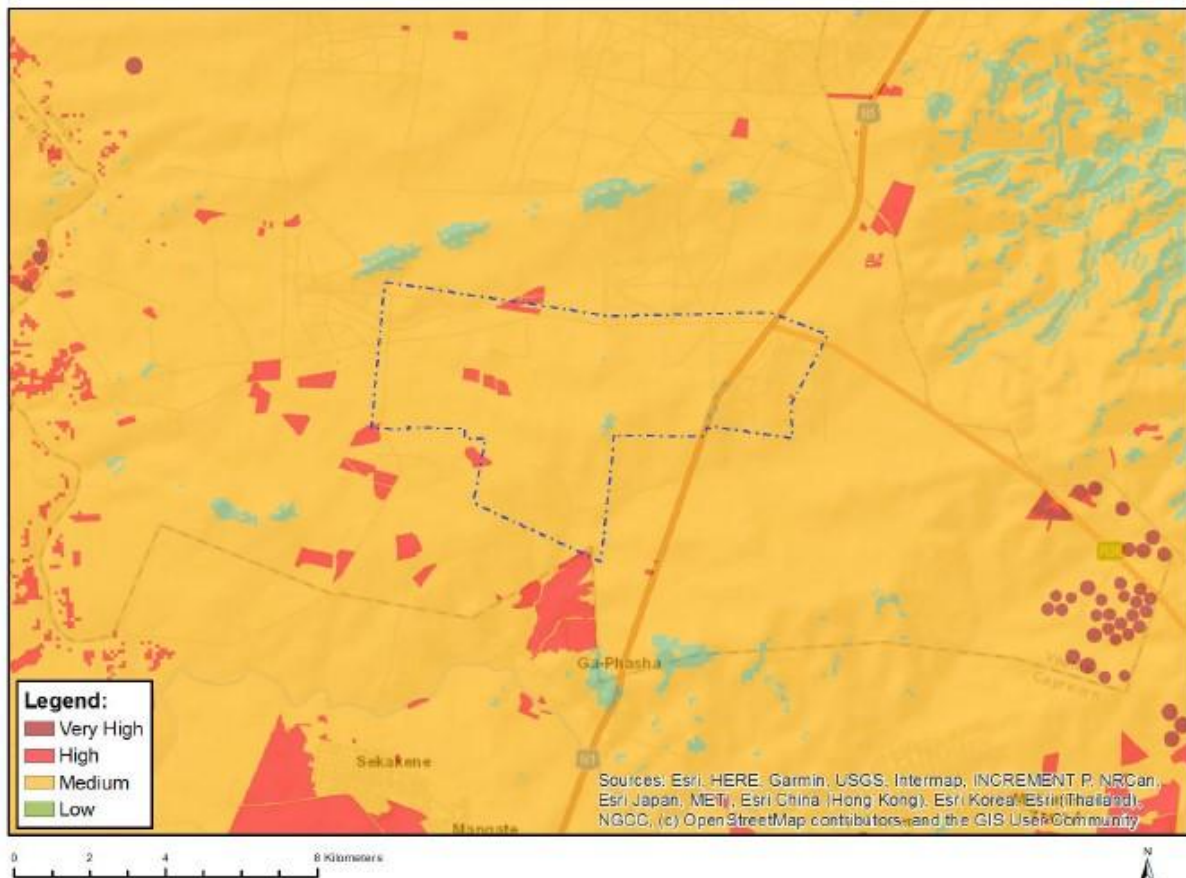


Figure 14: Agricultural sensitivity of the screening area, inclusive of the Bethel PV project's boundary area, according to the screening report of the Environmental Screening Tool

The areas around both the PV screening area as well as the grid connection area, consists mainly of land with Medium agricultural sensitivity. There are a few scattered blocks with High sensitivity around these areas that are associated with areas where crop production possibly occurs. The areas where centre pivots are present further away, has been indicated as having Very High agricultural sensitivity.

## 8.2 Verified agricultural sensitivity

After considering the desktop data and site verification data, the Bethel PV project area and grid connection alternatives have been assigned an agricultural sensitivity rating. The result is shown in Figure 15 and the area of each sensitivity class affected by the project boundary area and the grid connection alternatives, is summarised in Table 4.

The most significant part of the project area, has Low agricultural sensitivity (591.1 ha). The soils in this area has Low-Moderate and Low agricultural potential and is not suitable for crop production under rainfed conditions. There are no crop fields in these areas; the only land use is game and livestock farming. The site visit confirmed that areas indicated as “Old fields” by DALRRD (2019), has long ago reverted to natural veld.

Soils with Moderate agricultural potential have been assigned Medium sensitivity because they are suitable for supporting vegetation for grazing but not highly suitable for crop production. Within the project area, soil with Medium agricultural sensitivity measures 32.8 ha. While the preferred grid connection alternative consists mostly of land with Low agricultural sensitivity and only two areas of Medium agricultural sensitivity, the secondary and tertiary grid connection alternatives consist of more areas with Medium sensitivity as well as an area of 64 ha where the site could not be accessed for soil classification, that can either have Low or Medium sensitivity.

No areas with High agricultural sensitivity have been identified in either the PV area or the grid corridor area.

Table 4: Agricultural sensitivity of the project area and grid connection alternatives of the Bethel PV project

| Agricultural potential | Project area (ha) | Preferred grid connection (ha) | Secondary grid connection (ha) | Tertiary grid connection (ha) |
|------------------------|-------------------|--------------------------------|--------------------------------|-------------------------------|
| Medium                 | 32.8              | 11.1                           | 145.6                          | 88.5                          |
| Low                    | 591.1             | 564.2                          | 533.5                          | 589.2                         |
| Low/Medium             | -                 | -                              | 64.4                           | 64.3                          |

### 8.3 Allowable development limits

Following the sensitivity delineation of the development area, the allowable development limit for the project area of up to 625 ha, was calculated. The allowable development limit for areas outside crop field boundaries were used (as published in the GNR 320 guidelines. The results of the calculations are provided in Table 5 below.

Table 5: Calculated allowable development limits of the development footprint

| Sensitivity class | Area that will be affected by development footprint (ha) | Allowable limit (ha/MW) | Area allowed for a 240MW development (ha) | Area that exceeds allowable limit (ha) |
|-------------------|----------------------------------------------------------|-------------------------|-------------------------------------------|----------------------------------------|
| Medium            | 32.8                                                     | 0.35                    | 84                                        | 0                                      |
| Low               | 591.1                                                    | 2.50                    | 600                                       | 0                                      |

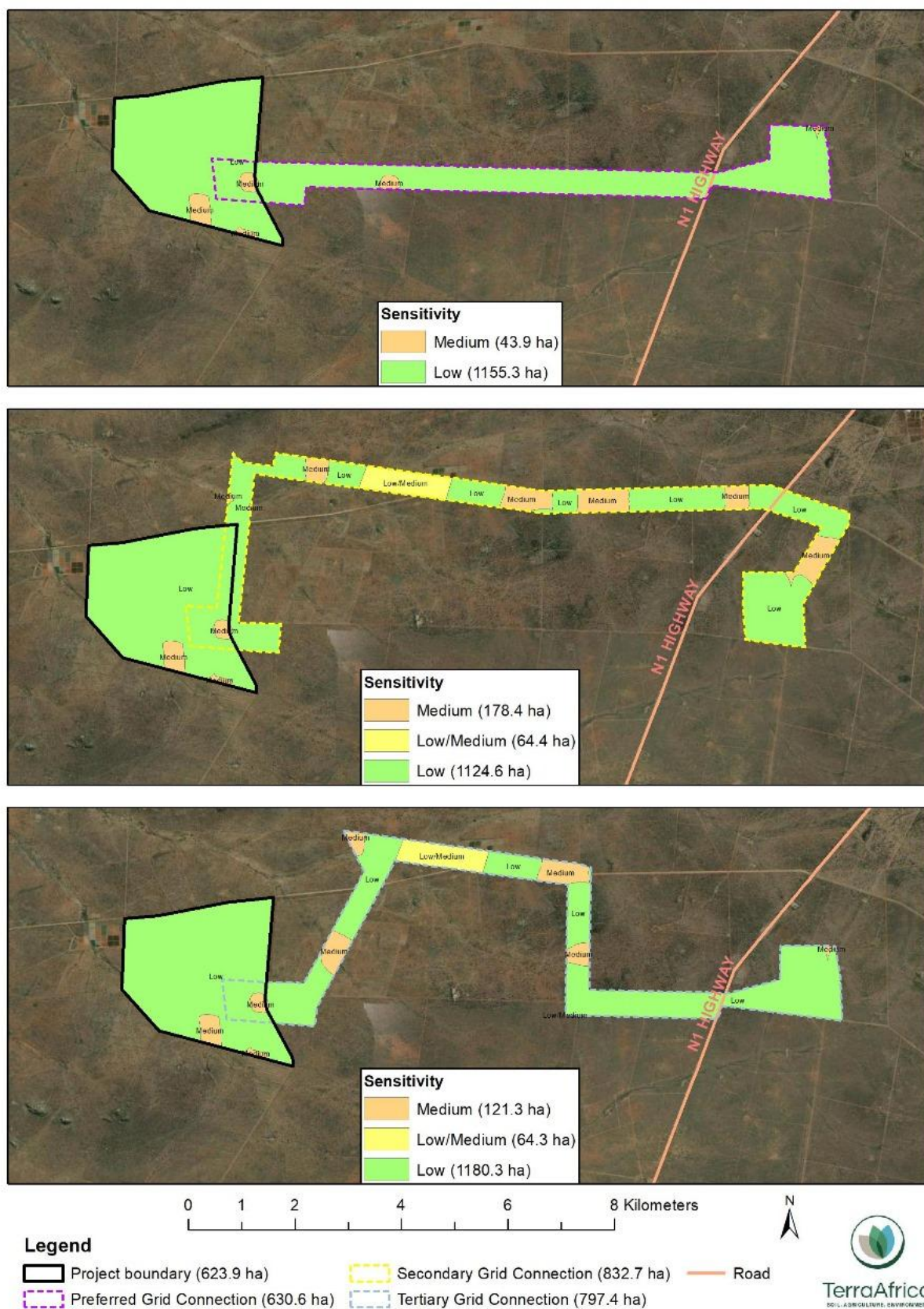


Figure 15: Agricultural sensitivity of the Bethel PV project area and grid connection alternatives

## 9. Impact assessment

### 9.1 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 temporary laydown areas. The cabling between the project components and the facility substation will also be laid underground. The fence around the array areas will be erected during this phase and this will exclude grazing of livestock until the end of the project life cycle.

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 PV modules and the offices and workshop. It is foreseen that the soil surfaces of the access roads will remain bare and will be exposed to soil erosion by wind and water movement. Under the PV modules, non-woody vegetation will be allowed to establish and will be maintained via brush-cutting.

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 PV modules and mounting structures are removed will be exposed to soil erosion and soil pollution with materials as well fuel and lubricants from the construction vehicles, are impacts associated with this phase.

### 9.2 Rating of impact significance

#### 9.2.1 Construction phase

##### a) 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. The area will also be fenced off and will no longer be accessible to livestock.

**Nature:** The availability of grazing land that can be used for livestock and game 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 |
|---------------|--------------------|-----------------|
| <b>Extent</b> | Local (1)          | Local (1)       |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                |                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------------------------|
| <b>Duration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Short duration - 2-5 years (2) | Very short duration - 0-1 years (1) |
| <b>Magnitude</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Low (4)                        | Minor (2)                           |
| <b>Probability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Definite (4)                   | Probable (3)                        |
| <b>Significance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Low (28)</b>                | <b>Low (12)</b>                     |
| <b>Status (positive or negative)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Negative                       | Negative                            |
| <b>Reversibility</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | High                           | High                                |
| <b>Irreplaceable loss of resources?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Yes                            | No                                  |
| <b>Can impacts be mitigated?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Yes                            | N/A                                 |
| <b>Mitigation:</b> <ul style="list-style-type: none"> <li>Vegetation clearance must be restricted to infrastructure and access road areas.</li> <li>Materials and equipment must only be stored in the pre-determined laydown areas.</li> <li>Prior arrangements must be made with the landowner and neighbouring landowners to ensure that farm animals are moved to areas where they cannot be injured by vehicles traversing the area.</li> <li>No boundary fence must be opened without the landowner or neighbouring landowners' permission.</li> <li>No open fires are allowable during the construction phase.</li> <li>The supporting infrastructure must be constructed as closely as possible to avoid fragmentation of the entire development area.</li> </ul> |                                |                                     |
| <b>Residual Impacts:</b><br>The residual impact from the construction of the project is considered low.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                |                                     |
| <b>Cumulative Impacts:</b><br>Any additional renewable energy projects to be developed in the area will result in additional areas where grazing will be unavailable for small stock farming.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                |                                     |

#### b) Soil erosion

All areas where vegetation is removed from the soil surface will result in exposed soil surfaces prone to erosion. Both wind and water erosion are a risk. 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 area's rock, lithic and hard carbonate material.

|                                                                                                                                                                                                                                                                                                             |                           |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|
| <b>Nature:</b> The clearing and levelling of land within the proposed development area will increase the risk of soil erosion. The risk is anticipated to naturally reduce as grass and lower shrubs re-establishes in the area once the construction has been completed and the operation phase commences. |                           |                        |
|                                                                                                                                                                                                                                                                                                             | <b>Without mitigation</b> | <b>With mitigation</b> |
| <b>Extent</b>                                                                                                                                                                                                                                                                                               | Local (1)                 | Local (1)              |
| <b>Duration</b>                                                                                                                                                                                                                                                                                             | Medium-term (3)           | Medium-term (3)        |
| <b>Magnitude</b>                                                                                                                                                                                                                                                                                            | Moderate (6)              | Low (4)                |
| <b>Probability</b>                                                                                                                                                                                                                                                                                          | Probable (3)              | Improbable (2)         |
| <b>Significance</b>                                                                                                                                                                                                                                                                                         | <b>Medium (30)</b>        | <b>Low (16)</b>        |
| <b>Status (positive or negative)</b>                                                                                                                                                                                                                                                                        | Negative                  | Negative               |
| <b>Reversibility</b>                                                                                                                                                                                                                                                                                        | Low                       | Low                    |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|
| <b>Irreplaceable loss of resources?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Yes | No  |
| <b>Can impacts be mitigated?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Yes | N/A |
| <b>Mitigation:</b> <ul style="list-style-type: none"> <li>Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint/servitude;</li> <li>Unnecessary land clearance must be avoided;</li> <li>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.</li> <li>Regularly monitor the site to check for areas where signs of soil erosion may start to appear.</li> <li>Should any soil erosion be detected, it must be addressed immediately through rehabilitation and surface stabilisation techniques.</li> </ul> |     |     |
| <b>Residual Impacts:</b><br>The residual impact from the project's construction on the susceptibility to erosion is considered low.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |     |     |
| <b>Cumulative Impacts:</b><br>Any additional renewable energy projects to be developed in the area will result in additional areas exposed to soil erosion through wind and water movement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |     |

### c) Soil pollution

During the construction phase, construction workers will access the land to prepare the terrain and construct the PV plant and access roads. Potential spills and leaks from construction vehicles and equipment and waste generation on site can result in soil pollution. Unsafe transport and handling of batteries can result in damaged batteries that can cause chemical pollution.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|
| <b>Nature:</b><br><br>The following construction activities can result in the chemical pollution of the soil: <ol style="list-style-type: none"> <li>Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the removal of vegetation as part of site preparation;</li> <li>Spills from vehicles transporting workers, equipment, and construction material to and from the construction site;</li> <li>The accidental spills from temporary chemical toilets used by construction workers;</li> <li>The generation of domestic waste by construction workers;</li> <li>Spills from fuel storage tanks during construction;</li> <li>Pollution from concrete mixing;</li> <li>Accidental damaging of batteries through transport and handling;</li> <li>Pollution from road-building materials; and</li> <li>Any construction material remaining within the construction area once construction is completed.</li> </ol> |                    |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Without mitigation | With mitigation |
| <b>Extent</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Local (1)          | Local (1)       |
| <b>Duration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Short-term (2)     | Short-term (2)  |
| <b>Magnitude</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Moderate (6)       | Low (4)         |
| <b>Probability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Low (4)            | Improbable (2)  |
| <b>Significance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Medium (36)        | Low (14)        |
| <b>Status (positive or negative)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Negative           | Negative        |
| <b>Reversibility</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Low                | Low             |
| <b>Irreplaceable loss of resources?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Yes                | No              |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|
| <b>Can impacts be mitigated?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Yes | N/A |
| <b>Mitigation:</b> <ul style="list-style-type: none"> <li>Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills;</li> <li>Any waste generated during construction must be stored into designated containers and removed from the site by the construction teams;</li> <li>Any left-over construction materials must be removed from site;</li> <li>The construction site must be monitored by the Environmental Control Officer (ECO) to detect any early signs of fuel and oil spills and waste dumping;</li> <li>Ensure battery transport and installation by accredited staff / contractors; and</li> <li>Compile (and adhere to) a procedure for safely handling battery cells during transport and installation.</li> </ul> |     |     |
| <b>Residual Impacts:</b><br>The residual impact from the construction and operation of the proposed project will be low to negligible.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |
| <b>Cumulative Impacts:</b><br>Any additional infrastructure that will be constructed to strengthen and support the operation of the Bethel PV Project and waste not removed to designated waste sites will increase the cumulative impacts associated with soil pollution in the area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |

d) 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 events.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|
| <b>Nature:</b> Earthworks for preparing the terrain where the PV modules, supporting infrastructure and the access roads will be installed, 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.                                                                                                                                                                       |                           |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Without mitigation</b> | <b>With mitigation</b> |
| <b>Extent</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Local (1)                 | Local (1)              |
| <b>Duration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Medium-term (3)           | Medium-term (3)        |
| <b>Magnitude</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Moderate (6)              | Low (4)                |
| <b>Probability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Probable (3)              | Improbable (2)         |
| <b>Significance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Medium (30)</b>        | <b>Low (16)</b>        |
| <b>Status (positive or negative)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Negative                  | Negative               |
| <b>Reversibility</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Low                       | Low                    |
| <b>Irreplaceable loss of resources?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Yes                       | No                     |
| <b>Can impacts be mitigated?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Yes                       | N/A                    |
| <b>Mitigation:</b> <ul style="list-style-type: none"> <li>Apart from the drilling and piling machines that need to install the PV arrays, all other vehicles and machines must utilise the internal access road network and not travel outside of it.</li> <li>Unnecessary land clearance must be avoided;</li> <li>High impact construction activities (i.e. road construction, trenching etc) should be done outside of the rainy season and</li> <li>Vehicles and equipment must park in designated parking areas.</li> </ul> |                           |                        |
| <b>Residual Impacts:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                        |

The residual impact from the proposed project's construction on soil compaction is considered low.

**Cumulative Impacts:**

Any additional renewable energy projects to be developed in the area will result in additional areas exposed to soil compaction.

## 9.2.2 Operation phase

### a) Soil erosion

During the operation phase, staff and maintenance personnel will access the development area daily. The following impacts on soil are expected for this phase:

**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 Development area.

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

**Mitigation:**

- The area around the project, including the internal access roads, must regularly be monitored to detect early signs of soil erosion on-set; and
- If soil erosion is detected, the area must be stabilised using geo-textiles and facilitated re-vegetation.

**Residual Impacts:**

The residual impact from the project's operation on the susceptibility to erosion is considered low.

**Cumulative Impacts:**

Any additional infrastructure constructed to strengthen and support the project's operation will result in additional areas exposed to soil erosion through wind and water movement.

### b) Soil pollution

**Nature:** During the operational phase, potential spills and leaks from maintenance vehicles and equipment and waste generation on site can result in soil pollution. Also, any spillages around the workshop area or damaged infrastructure, such as batteries, inverters and transformers, can be a source of soil pollution.

|                  | Without mitigation | With mitigation |
|------------------|--------------------|-----------------|
| <b>Extent</b>    | Local (1)          | Local (1)       |
| <b>Duration</b>  | Short-term (2)     | Short-term (2)  |
| <b>Magnitude</b> | Moderate (6)       | Low (4)         |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------|
| <b>Probability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Low (4)            | Improbable (2)  |
| <b>Significance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Medium (36)</b> | <b>Low (14)</b> |
| <b>Status (positive or negative)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Negative           | Negative        |
| <b>Reversibility</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Low                | Low             |
| <b>Irreplaceable loss of resources?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Yes                | No              |
| <b>Can impacts be mitigated?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Yes                | N/A             |
| <b>Mitigation:</b> <ul style="list-style-type: none"> <li>• Maintenance must be undertaken regularly on all vehicles and maintenance machinery to prevent hydrocarbon spills;</li> <li>• 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 and</li> <li>• Regularly monitor areas alongside the roads, parking area and workshop for any signs of oil, grease and fuel spillage or waste.</li> </ul> |                    |                 |
| <b>Residual Impacts:</b><br>The residual impact from the operation of the proposed project will be low to negligible.                                                                                                                                                                                                                                                                                                                                                                             |                    |                 |
| <b>Cumulative Impacts:</b><br>The operation of any additional infrastructure to strengthen and support the operation of the Bethel PV Facility and waste not removed to designated waste sites will increase the cumulative impacts associated with soil pollution in the area.                                                                                                                                                                                                                   |                    |                 |

### 9.2.3 Decommissioning phase

The decommissioning phase will have the same impacts as the construction phase i.e. soil erosion, soil compaction and soil pollution. It is anticipated that the risk of soil erosion will especially remain until the vegetation growth has re-established in the area where the project infrastructure was decommissioned.

## 10. 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<sup>1</sup>. 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 other renewable energy projects have already been authorised (refer to

Figure 16). In addition to that, there are three other PV projects that are currently applied for and that are adjacent to the Bethel PV project’s location. These three projects are the Draailoop, Makoppa and Klipput PV projects respectively. The cumulative impacts of the

<sup>1</sup> Unless otherwise stated, all definitions are from the EIA Regulations 2014 (GNR 326).

proposed project have been discussed in Section 9 above. Below follows the rating of each of the cumulative impacts.

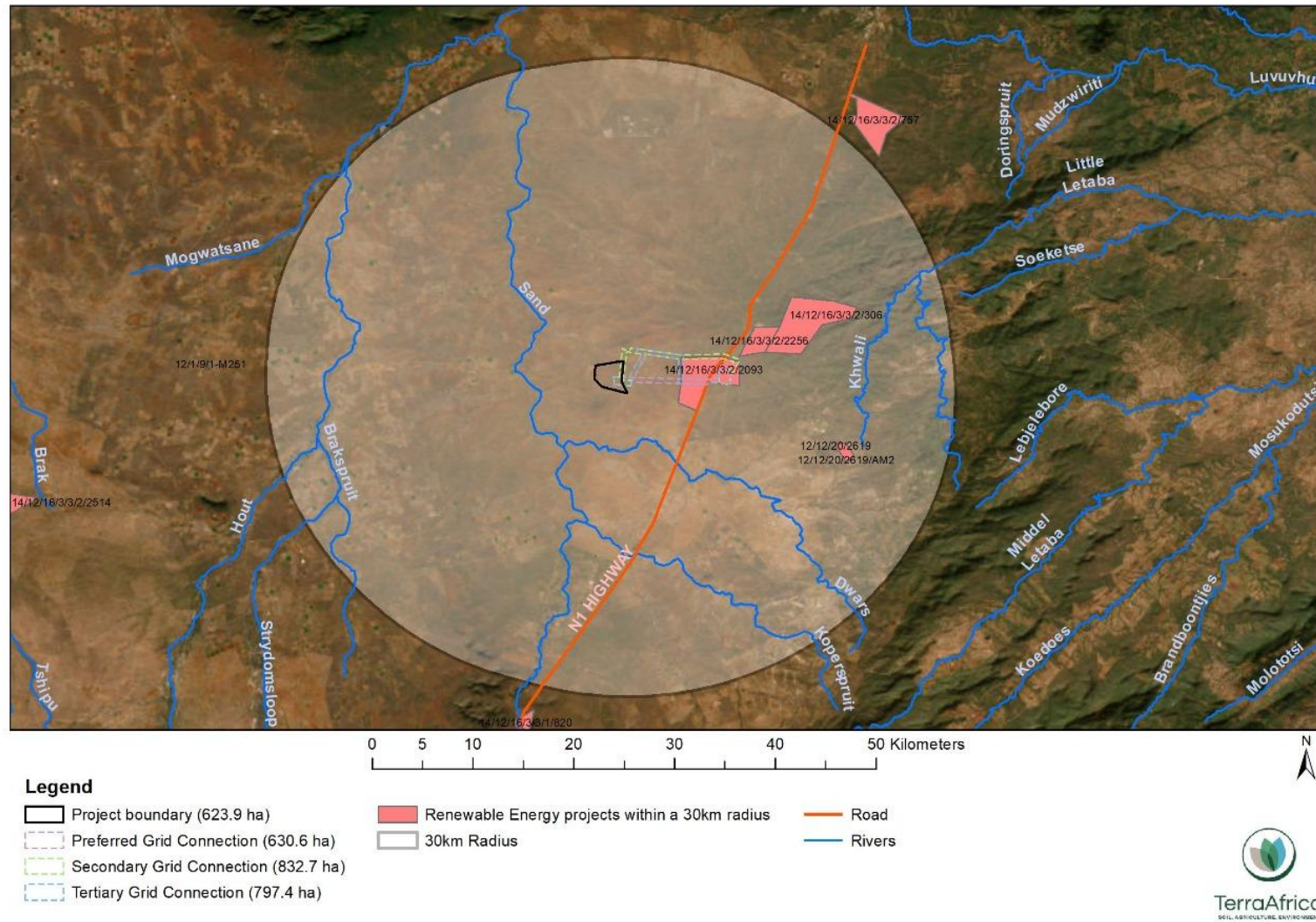


Figure 16: Locality of other renewable energy projects in the area that may result in cumulative impacts

Table 6 Assessment of cumulative impact of decrease in areas available for farming activities

|                                                                                                                                                                                                                                                                 |                                                                       |                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>Nature:</b><br>Additional PV and other renewable energy projects will increase the areas that are fenced off and where farming activities can no longer continue. This will result in a decrease in areas with suitable land capability for food production. |                                                                       |                                                                        |
|                                                                                                                                                                                                                                                                 | <b>Overall impact of the proposed project considered in isolation</b> | <b>Cumulative impact of the project and other projects in the area</b> |
| <b>Extent</b>                                                                                                                                                                                                                                                   | Local (1)                                                             | Regional (2)                                                           |
| <b>Duration</b>                                                                                                                                                                                                                                                 | Medium duration (3)                                                   | Medium duration (3)                                                    |
| <b>Magnitude</b>                                                                                                                                                                                                                                                | Moderate (6)                                                          | Moderate (6)                                                           |
| <b>Probability</b>                                                                                                                                                                                                                                              | Definite (4)                                                          | Definite (4)                                                           |
| <b>Significance</b>                                                                                                                                                                                                                                             | <b>Medium (40)</b>                                                    | <b>Medium (44)</b>                                                     |
| <b>Status (positive/negative)</b>                                                                                                                                                                                                                               | Negative                                                              | Negative                                                               |
| <b>Reversibility</b>                                                                                                                                                                                                                                            | High                                                                  | Low                                                                    |
| <b>Loss of resources?</b>                                                                                                                                                                                                                                       | Yes                                                                   | Yes                                                                    |
| <b>Can impacts be mitigated?</b>                                                                                                                                                                                                                                | Yes                                                                   | No                                                                     |
| <b>Confidence in findings:</b><br>High.                                                                                                                                                                                                                         |                                                                       |                                                                        |
| <b>Mitigation:</b><br>The only mitigation measure for this impact is to keep the footprints of all renewable energy facilities as small as possible and to manage the soil quality by avoiding far-reaching soil degradation such as erosion.                   |                                                                       |                                                                        |

Table 7 Assessment of cumulative impact of areas susceptible to soil erosion

|                                                                                                                                                                                                                                                                                                                                      |                                                                       |                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------|
| <b>Nature:</b><br>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. |                                                                       |                                                                        |
|                                                                                                                                                                                                                                                                                                                                      | <b>Overall impact of the proposed project considered in isolation</b> | <b>Cumulative impact of the project and other projects in the area</b> |
| <b>Extent</b>                                                                                                                                                                                                                                                                                                                        | Local (1)                                                             | Regional (2)                                                           |
| <b>Duration</b>                                                                                                                                                                                                                                                                                                                      | Medium-term (3)                                                       | Medium-term (3)                                                        |
| <b>Magnitude</b>                                                                                                                                                                                                                                                                                                                     | Moderate (6)                                                          | Moderate (6)                                                           |
| <b>Probability</b>                                                                                                                                                                                                                                                                                                                   | Probable (3)                                                          | Probable (3)                                                           |
| <b>Significance</b>                                                                                                                                                                                                                                                                                                                  | <b>Medium (30)</b>                                                    | <b>Medium (33)</b>                                                     |
| <b>Status (positive/negative)</b>                                                                                                                                                                                                                                                                                                    | Negative                                                              | Negative                                                               |
| <b>Reversibility</b>                                                                                                                                                                                                                                                                                                                 | Low                                                                   | Low                                                                    |
| <b>Loss of resources?</b>                                                                                                                                                                                                                                                                                                            | Yes                                                                   | Yes                                                                    |
| <b>Can impacts be mitigated?</b>                                                                                                                                                                                                                                                                                                     | Yes                                                                   | No                                                                     |
| <b>Confidence in findings:</b><br>High.                                                                                                                                                                                                                                                                                              |                                                                       |                                                                        |
| <b>Mitigation:</b><br>Each of the projects should adhere to the highest standards for soil erosion prevention and management, as defined in Section 10 above.                                                                                                                                                                        |                                                                       |                                                                        |

Table 8 Assessment of cumulative impact of areas susceptible to soil compaction

| <b>Nature:</b><br>Increase in areas with compacted soils because any additional access roads, PV array areas and buildings will require deliberate compaction to ensure a stable surface prior to construction. The increased size of compacted areas will increase the risk surface water run-off and reduced water infiltration into soil profiles. |                                                                       |                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                       | <b>Overall impact of the proposed project considered in isolation</b> | <b>Cumulative impact of the project and other projects in the area</b> |
| <b>Extent</b>                                                                                                                                                                                                                                                                                                                                         | Local (1)                                                             | Regional (2)                                                           |
| <b>Duration</b>                                                                                                                                                                                                                                                                                                                                       | Medium-term (3)                                                       | Medium-term (3)                                                        |
| <b>Magnitude</b>                                                                                                                                                                                                                                                                                                                                      | Low (4)                                                               | Low (4)                                                                |
| <b>Probability</b>                                                                                                                                                                                                                                                                                                                                    | Improbable (2)                                                        | Probable (3)                                                           |
| <b>Significance</b>                                                                                                                                                                                                                                                                                                                                   | <b>Low (16)</b>                                                       | <b>Low (27)</b>                                                        |
| <b>Status (positive/negative)</b>                                                                                                                                                                                                                                                                                                                     | Negative                                                              | Negative                                                               |
| <b>Reversibility</b>                                                                                                                                                                                                                                                                                                                                  | Low                                                                   | Low                                                                    |
| <b>Loss of resources?</b>                                                                                                                                                                                                                                                                                                                             | No                                                                    | No                                                                     |
| <b>Can impacts be mitigated?</b>                                                                                                                                                                                                                                                                                                                      | Yes                                                                   | Yes                                                                    |
| <b>Confidence in findings:</b><br>High.                                                                                                                                                                                                                                                                                                               |                                                                       |                                                                        |
| <b>Mitigation:</b><br>Each of the projects should adhere to the highest standards for soil compaction prevention and management, as defined in Section 9 above.                                                                                                                                                                                       |                                                                       |                                                                        |

Table 9 Assessment of cumulative impact of increased risk of soil pollution

| <b>Nature:</b><br>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. |                                                                       |                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Overall impact of the proposed project considered in isolation</b> | <b>Cumulative impact of the project and other projects in the area</b> |
| <b>Extent</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Local (1)                                                             | Regional (2)                                                           |
| <b>Duration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Short-term (2)                                                        | Short-term (2)                                                         |
| <b>Magnitude</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Moderate (6)                                                          | Moderate (6)                                                           |
| <b>Probability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Probable (3)                                                          | Probable (3)                                                           |
| <b>Significance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Low (27)</b>                                                       | <b>Medium (30)</b>                                                     |
| <b>Status (positive/negative)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Negative                                                              | Negative                                                               |
| <b>Reversibility</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Low                                                                   | Low                                                                    |
| <b>Loss of resources?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes                                                                   | Yes                                                                    |
| <b>Can impacts be mitigated?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Yes                                                                   | No                                                                     |
| <b>Confidence in findings:</b><br>High.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                       |                                                                        |
| <b>Mitigation:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                       |                                                                        |

Each of the projects should adhere to the highest standards for soil pollution prevention and management, as defined in Section 10 above.

## 12. Acceptability statement

Following the data analysis and impact assessment above, the proposed Bethel Solar PV Facility and Associated Infrastructure is considered an acceptable development within the development area that was assessed. The project boundary area consists of seven different soil forms that mostly have Low and Low-Moderate agricultural potential, with an area of 32.8 ha that has Moderate agricultural potential. The areas with Low and Low-Moderate agricultural potential have Low agricultural sensitivity since it is used for extensive grazing of livestock and game, and there is no crop production. The areas with Moderate agricultural potential have Medium agricultural sensitivity and will support better vegetation growth.

The project boundary area, where solar panels will be located, will temporarily be fenced off and won't be available for grazing for the life of the project. At a long-term grazing capacity of 9 ha/LSU, the forage within the project boundary can feed **69 Large Stock Units**. This forage will no longer be available for livestock or game farming once construction of the Bethel PV project commences. The grid connection corridors are not expected to significantly impact the area's grazing capacity and, thereby, livestock and game farming. Even though the impacts are expected to recover within two years after construction commenced, the shortest grid connection is the preferred one from the perspective of agricultural impacts. Therefore, the preferred grid connection is considered the one that will result in the least impacts on agricultural resources.

The development footprint is within the allowable development limits for a 240 MW project, as stipulated in GNR 320.

While the development of the Bethel Solar Facility and Associated Infrastructure may be a more or as sustainable a land use as agriculture, 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 to maintain the infrastructure.

It is my professional opinion that this application be considered favourably, permitting that the mitigation measures are followed to prevent soil erosion and soil pollution and to minimise impacts on the veld quality of the land parcels that will be affected. The project infrastructure should also remain within the development area boundaries and in the positions indicated in the layout map.

### 13. Reference list

Crop Estimates Consortium, 2019. *Field crop boundary data layer (Limpopo province)*, 2019. Pretoria. Department of Agriculture, Land Reform and Rural Development.

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

**APPENDIX 1 – SOIL CLASSIFICATION DATA OF SURVEY POINTS**

| Survey point no. | Coordinates |           | Soil form <sup>2</sup> | Clay content (%) |           | Soil colour (Moist) |           | Effective depth (mm) | Depth-limiting material | Current land use |
|------------------|-------------|-----------|------------------------|------------------|-----------|---------------------|-----------|----------------------|-------------------------|------------------|
|                  | Latitude    | Longitude |                        | A horizon        | B horizon | A horizon           | B horizon |                      |                         |                  |
| 1                | -23,328352  | 29,669744 | Nkonkoni               | 12               | 16        | 2.5YR 3/3           | 2.5YR 3/4 | 300                  | Lithic                  | Grazing          |
| 2                | -23,331945  | 29,669744 | Bainsvlei              | 12               | 16        | 2.5YR 3/3           | 2.5YR 3/4 | 850                  | Lithic                  | Grazing          |
| 3                | -23,335539  | 29,669744 | Vaalbos                | 12               | 16        | 2.5YR 3/3           | 2.5YR 3/4 | 350                  | Hard Rock               | Grazing          |
| 4                | -23,339132  | 29,669744 | Vaalbos                | 12               | 16        | 2.5YR 3/3           | 2.5YR 3/4 | 300                  | Hard Rock               | Grazing          |
| 5                | -23,342724  | 29,669744 | Nkonkoni               | 12               | 16        | 2.5YR 3/3           | 2.5YR 3/4 | 300                  | Lithic                  | Grazing          |
| 6                | -23,346317  | 29,669744 | Vaalbos                | 12               | 16        | 2.5YR 3/3           | 2.5YR 3/4 | 300                  | Hard Rock               | Grazing          |
| 7                | -23,34991   | 29,669744 | Katspruit              | 12               | 25        | 10YR 5/1            | 10YR 6/1  | 250                  | Gley                    | Grazing          |
| 8                | -23,353503  | 29,669744 | Nkonkoni               | 12               | 16        | 2.5YR 3/3           | 2.5YR 3/4 | 300                  | Saprolite               | Grazing          |
| 9                | -23,357096  | 29,669744 | Glenrosa               | 12               | -         | 2.5YR 3/3           | -         | 200                  | Lithic                  | Grazing          |
| 10               | -23,360689  | 29,669744 | Mispah                 | 14               | -         | 2.5YR 3/3           | -         | 100                  | Hard Rock               | Grazing          |
| 11               | -23,364282  | 29,669744 | Nkonkoni               | 12               | 16        | 2.5YR 3/3           | 2.5YR 3/4 | 300                  | Lithic                  | Grazing          |

<sup>2</sup> Soil form classification was done according to the latest version (Third Revised Edition) of the South African Soil Classification System (Soil Classification Working Group, 2018).

|    |              |           |          |    |    |              |              |     |           |         |
|----|--------------|-----------|----------|----|----|--------------|--------------|-----|-----------|---------|
| 12 | -23,367875   | 29,669744 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 300 | Hard Rock | Grazing |
| 13 | -23,371468   | 29,669744 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Lithic    | Grazing |
| 14 | -23,375061   | 29,669744 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 300 | Hard Rock | Grazing |
| 15 | -23,378654   | 29,669744 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 300 | Hard Rock | Grazing |
| 16 | -23,389433   | 29,669744 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 300 | Hard Rock | Grazing |
| 17 | -23,393026   | 29,669744 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Lithic    | Grazing |
| 18 | -23,396619   | 29,669744 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 300 | Hard Rock | Grazing |
| 19 | -23,39694457 | 29,673721 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 300 | Hard Rock | Grazing |
| 20 | -23,39333386 | 29,673721 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock | Grazing |
| 21 | -23,38972314 | 29,673721 | Cartref  | 6  | 6  | 10YR 4/1     | 10YR 6/2     | 300 | Lithic    | Grazing |
| 22 | -23,38611243 | 29,673721 | Clovelly | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 400 | Lithic    | Grazing |
| 23 | -23,38250171 | 29,673721 | Nkonkoni | 6  | 8  | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Lithic    | Grazing |
| 24 | -23,378891   | 29,673721 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 400 | Saprolite | Grazing |
| 25 | -23,37528029 | 29,673721 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 400 | Lithic    | Grazing |
| 26 | -23,37166957 | 29,673721 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 450 | Saprolite | Grazing |

|    |              |           |           |    |    |              |              |     |           |         |
|----|--------------|-----------|-----------|----|----|--------------|--------------|-----|-----------|---------|
| 27 | -23,36805886 | 29,673721 | Vaalbos   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock | Grazing |
| 28 | -23,36444814 | 29,673721 | Vaalbos   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock | Grazing |
| 29 | -23,36083743 | 29,673721 | Glenrosa  | 12 | -  | 7.5YR<br>3/3 | -            | 200 | Lithic    | Grazing |
| 30 | -23,35722671 | 29,673721 | Glenrosa  | 12 | -  | 2.5YR<br>3/3 | -            | 200 | Lithic    | Grazing |
| 31 | -23,353616   | 29,673721 | Mispah    | 12 | -  | 2.5YR<br>3/3 | -            | 100 | Hard Rock | Grazing |
| 32 | -23,350006   | 29,673721 | Vaalbos   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock | Grazing |
| 33 | -23,346395   | 29,673714 | Mispah    | 15 | -  | 2.5YR<br>3/3 | -            | 150 | Hard Rock | Grazing |
| 34 | -23,342783   | 29,673708 | Vaalbos   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock | Grazing |
| 35 | -23,339172   | 29,673714 | Bainsvlei | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 900 | Lithic    | Grazing |
| 36 | -23,335562   | 29,673708 | Nkonkoni  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 450 | Lithic    | Grazing |
| 37 | -23,339182   | 29,677639 | Nkonkoni  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 450 | Lithic    | Grazing |
| 38 | -23,342794   | 29,677639 | Nkonkoni  | 6  | 8  | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500 | Lithic    | Grazing |
| 39 | -23,346401   | 29,677649 | Glenrosa  | 12 | -  | 2.5YR<br>3/3 | -            | 200 | Lithic    | Grazing |
| 40 | -23,350008   | 29,677639 | Vaalbos   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock | Grazing |
| 41 | -23,353619   | 29,677649 | Vaalbos   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock | Grazing |

|    |              |             |             |    |    |              |              |     |               |         |
|----|--------------|-------------|-------------|----|----|--------------|--------------|-----|---------------|---------|
| 42 | -23,35722833 | 29,677649   | Mispah      | 12 | -  | 7.5YR<br>3/3 | -            | 200 | Hard Rock     | Grazing |
| 43 | -23,36083762 | 29,677649   | Lichtenburg | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 900 | Hard Plinthic | Grazing |
| 44 | -23,36444469 | 29,677649   | Vaalbos     | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock     | Grazing |
| 45 | -23,36805619 | 29,677649   | Vaalbos     | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock     | Grazing |
| 46 | -23,37166548 | 29,677649   | Vaalbos     | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock     | Grazing |
| 47 | -23,37527476 | 29,677649   | Vaalbos     | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock     | Grazing |
| 48 | -23,37888405 | 29,677649   | Vaalbos     | 12 | 15 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock     | Grazing |
| 49 | -23,38249333 | 29,677649   | Nkonkoni    | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500 | Lithic        | Grazing |
| 50 | -23,38610262 | 29,677649   | Nkonkoni    | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500 | Lithic        | Grazing |
| 51 | -23,38971119 | 29,677649   | Glenrosa    | 12 | -  | 2.5YR<br>3/3 | -            | 200 | Lithic        | Grazing |
| 52 | -23,39332119 | 29,677649   | Vaalbos     | 12 | 15 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 350 | Hard Rock     | Grazing |
| 53 | -23,39693048 | 29,677649   | Mispah      | 12 | -  | 2.5YR<br>3/3 | -            | 200 | Hard Rock     | Grazing |
| 54 | -23,3968951  | 29,68163562 | Vaalbos     | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 400 | Hard Rock     | Grazing |
| 55 | -23,3932876  | 29,68163128 | Carolina    | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 500 | Hard Rock     | Grazing |
| 56 | -23,3896801  | 29,68162693 | Carolina    | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 550 | Hard Rock     | Grazing |

|    |             |             |          |    |    |              |              |      |           |         |
|----|-------------|-------------|----------|----|----|--------------|--------------|------|-----------|---------|
| 57 | -23,3860726 | 29,68162259 | Hutton   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -         | Grazing |
| 58 | -23,3824651 | 29,68162    | Hutton   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -         | Grazing |
| 59 | -23,37886   | 29,6816139  | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500  | Lithic    | Grazing |
| 60 | -23,3752501 | 29,68160956 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 400  | Hard Rock | Grazing |
| 61 | -23,3716426 | 29,68160522 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500  | Lithic    | Grazing |
| 62 | -23,3680351 | 29,68160088 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 450  | Hard Rock | Grazing |
| 63 | -23,3644276 | 29,68159653 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500  | Lithic    | Grazing |
| 64 | -23,3608201 | 29,681591   | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 200  | Lithic    | Grazing |
| 65 | -23,357212  | 29,681591   | Glenrosa | 22 | -  | 7.5YR<br>3/3 | -            | 200  | Lithic    | Grazing |
| 66 | -23,353605  | 29,681581   | Tukulu   | 15 | 22 | 10YR 4/2     | 10YR 3/4     | 900  | Gleyic    | Grazing |
| 67 | -23,349998  | 29,681581   | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 450  | Hard Rock | Grazing |
| 68 | -23,346392  | 29,681572   | Glenrosa | 14 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 69 | -23,342781  | 29,681572   | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 70 | -23,346388  | 29,685505   | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500  | Lithic    | Grazing |
| 71 | -23,349993  | 29,685514   | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 550  | Lithic    | Grazing |

|    |             |           |          |    |    |              |              |     |           |         |
|----|-------------|-----------|----------|----|----|--------------|--------------|-----|-----------|---------|
| 72 | -23,3536    | 29,685505 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 450 | Hard Rock | Grazing |
| 73 | -23,35721   | 29,68551  | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 550 | Lithic    | Grazing |
| 74 | -23,360819  | 29,685507 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500 | Hard Rock | Grazing |
| 75 | -23,364431  | 29,685514 | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250 | Lithic    | Grazing |
| 76 | -23,3680391 | 29,685514 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500 | Hard Rock | Grazing |
| 77 | -23,3716486 | 29,685514 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500 | Hard Rock | Grazing |
| 78 | -23,3752581 | 29,685514 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 500 | Hard Rock | Grazing |
| 79 | -23,3788676 | 29,685514 | Mispah   | 12 | -  | 2.5YR<br>3/3 | -            | 250 | Hard Rock | Grazing |
| 80 | -23,3824771 | 29,685514 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 550 | Hard Rock | Grazing |
| 81 | -23,3860866 | 29,685514 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 550 | Lithic    | Grazing |
| 82 | -23,3896961 | 29,685514 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 550 | Hard Rock | Grazing |
| 83 | -23,3933056 | 29,685514 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 550 | Hard Rock | Grazing |
| 84 | -23,3969151 | 29,685514 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 550 | Lithic    | Grazing |
| 85 | -23,4005246 | 29,685514 | Glenrosa | 6  | -  | 2.5YR<br>3/3 | -            | 250 | Lithic    | Grazing |
| 86 | -23,396925  | 29,68949  | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 550 | Hard Rock | Grazing |

|     |            |           |          |    |    |              |              |      |           |         |
|-----|------------|-----------|----------|----|----|--------------|--------------|------|-----------|---------|
| 87  | -23,393315 | 29,68949  | Carolina | 6  | 8  | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 900  | Hard Rock | Grazing |
| 88  | -23,389705 | 29,68949  | Avalon   | 14 | 18 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 750  | Lithic    | Grazing |
| 89  | -23,386095 | 29,68949  | Mispah   | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Hard Rock | Grazing |
| 90  | -23,382485 | 29,68949  | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Hard Rock | Grazing |
| 91  | -23,378875 | 29,68949  | Hutton   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -         | Grazing |
| 92  | -23,375265 | 29,68948  | Glenrosa | 6  | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 93  | -23,371655 | 29,68948  | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Hard Rock | Grazing |
| 94  | -23,368046 | 29,68948  | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Hard Rock | Grazing |
| 95  | -23,364437 | 29,689474 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Hard Rock | Grazing |
| 96  | -23,360826 | 29,689466 | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 97  | -23,357216 | 29,689459 | Tukulu   | 18 | 24 | 10YR 4/2     | 10YR 3/4     | 1200 | -         | Grazing |
| 98  | -23,353605 | 29,689453 | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 99  | -23,349995 | 29,689444 | Glenrosa | 6  | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 100 | -23,353609 | 29,693371 | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 101 | -23,357224 | 29,693377 | Mispah   | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Hard Rock | Grazing |

|     |              |           |          |    |    |              |              |      |           |         |
|-----|--------------|-----------|----------|----|----|--------------|--------------|------|-----------|---------|
| 102 | -23,360826   | 29,693377 | Carolina | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 900  | Hard Rock | Grazing |
| 103 | -23,364433   | 29,693384 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 650  | Hard Rock | Grazing |
| 104 | -23,368044   | 29,693419 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 105 | -23,371651   | 29,693411 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 700  | Hard Rock | Grazing |
| 106 | -23,375259   | 29,693419 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 700  | Hard Rock | Grazing |
| 107 | -23,37886771 | 29,693419 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 108 | -23,38247593 | 29,693419 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Lithic    | Grazing |
| 109 | -23,38608414 | 29,693419 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 110 | -23,38969236 | 29,693419 | Clovelly | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 450  | Lithic    | Grazing |
| 111 | -23,389719   | 29,69734  | Hutton   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -         | Grazing |
| 112 | -23,386108   | 29,69734  | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 113 | -23,382497   | 29,69734  | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 114 | -23,378886   | 29,69734  | Mispah   | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Hard Rock | Grazing |
| 115 | -23,375275   | 29,697329 | Mispah   | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Hard Rock | Grazing |
| 116 | -23,371662   | 29,697329 | Mispah   | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Hard Rock | Grazing |

|     |            |            |          |    |    |              |              |      |           |         |
|-----|------------|------------|----------|----|----|--------------|--------------|------|-----------|---------|
| 117 | -23,368052 | 29,697323  | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 750  | Hard Rock | Grazing |
| 118 | -23,364439 | 29,697315  | Hutton   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -         | Grazing |
| 119 | -23,360828 | 29,697309  | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 120 | -23,35722  | 29,697309  | Ermelo   | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 1200 | -         | Grazing |
| 121 | -23,353609 | 29,697309  | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 122 | -23,353598 | 29,701244  | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 123 | -23,357208 | 29,701239  | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Lithic    | Grazing |
| 124 | -23,360819 | 29,701244  | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 125 | -23,364428 | 29,70125   | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 800  | Hard Rock | Grazing |
| 126 | -23,368042 | 29,70125   | Hutton   | 6  | 11 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -         | Grazing |
| 127 | -23,371648 | 29,7012523 | Hutton   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -         | Grazing |
| 128 | -23,378868 | 29,7012569 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 800  | Hard Rock | Grazing |
| 129 | -23,382478 | 29,7012592 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 130 | -23,386088 | 29,7012615 | Mispah   | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Hard Rock | Grazing |
| 131 | -23,389698 | 29,7012638 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |

|     |            |           |          |    |    |              |              |      |           |         |
|-----|------------|-----------|----------|----|----|--------------|--------------|------|-----------|---------|
| 132 | -23,389698 | 29,705168 | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 133 | -23,386088 | 29,705168 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 135 | -23,378868 | 29,705168 | Mispah   | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Hard Rock | Grazing |
| 136 | -23,364431 | 29,705164 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 137 | -23,360823 | 29,705173 | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 138 | -23,357208 | 29,705168 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Saprolite | Grazing |
| 139 | -23,353598 | 29,705173 | Hutton   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -         | Grazing |
| 140 | -23,378874 | 29,709095 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 900  | Hard Rock | Grazing |
| 141 | -23,382483 | 29,709095 | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 900  | Hard Rock | Grazing |
| 142 | -23,386095 | 29,709101 | Vaalbos  | 6  | 11 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 900  | Hard Rock | Grazing |
| 143 | -23,389709 | 29,709095 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 144 | -23,393324 | 29,713034 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 145 | -23,389715 | 29,71303  | Rock     | 0  | -  | -            | -            | 0    | -         | Grazing |
| 146 | -23,386103 | 29,713024 | Hutton   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -         | Grazing |
| 147 | -23,382494 | 29,71303  | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 900  | Hard Rock | Grazing |

|     |            |           |          |    |    |              |              |      |           |         |
|-----|------------|-----------|----------|----|----|--------------|--------------|------|-----------|---------|
| 148 | -23,378878 | 29,71303  | Hutton   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 |           | Grazing |
| 149 | -23,378344 | 29,7172   | Vaalbos  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 950  | Hard Rock | Grazing |
| 150 | -23,37822  | 29,72134  | Rock     | 0  | -  | -            | -            | 0    | -         | Grazing |
| 151 | -23,378383 | 29,725458 | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 152 | -23,378555 | 29,729583 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 153 | -23,378721 | 29,733707 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 154 | -23,378847 | 29,737816 | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 155 | -23,379021 | 29,741934 | Glenrosa | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 156 | -23,379149 | 29,746056 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 157 | -23,379236 | 29,750166 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Lithic    | Grazing |
| 158 | -23,379353 | 29,754305 | Clovelly | 15 | 20 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 600  | Lithic    | Grazing |
| 159 | -23,379462 | 29,758413 | Clovelly | 16 | 22 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 650  | Lithic    | Grazing |
| 160 | -23,379529 | 29,762536 | Nkonkoni | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Lithic    | Grazing |
| 161 | -23,37957  | 29,766695 | Glenrosa | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |
| 162 | -23,379022 | 29,770779 | Glenrosa | 16 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic    | Grazing |

|     |            |           |           |    |    |              |              |      |           |         |
|-----|------------|-----------|-----------|----|----|--------------|--------------|------|-----------|---------|
| 163 | -23,377922 | 29,774742 | Kroonstad | 10 | 12 | 7.5YR<br>3/3 | 10YR 6/2     | 550  | Gley      | Grazing |
| 164 | -23,376778 | 29,778694 | Nkonkoni  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Lithic    | Grazing |
| 170 | -23,355805 | 29,73005  | Nkonkoni  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Lithic    | Grazing |
| 171 | -23,356351 | 29,734185 | Nkonkoni  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Lithic    | Grazing |
| 172 | -23,356911 | 29,738323 | Vaalbos   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1000 | Hard Rock | Grazing |
| 173 | -23,357475 | 29,742488 | Vaalbos   | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1000 | Hard Rock | Grazing |
| 174 | -23,357526 | 29,746702 | Nkonkoni  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Lithic    | Grazing |
| 175 | -23,357428 | 29,750884 | Ermelo    | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 1200 | -         | Grazing |
| 176 | -23,357369 | 29,755056 | Ermelo    | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 1200 | -         | Grazing |
| 177 | -23,357282 | 29,759263 | Clovelly  | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 700  | Lithic    | Grazing |
| 178 | -23,357249 | 29,763493 | Mispah    | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Hard Rock | Grazing |
| 179 | -23,357151 | r         | Nkonkoni  | 16 | 22 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 600  | Lithic    | Grazing |
| 180 | -23,357125 | 29,771866 | Clovelly  | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 800  | Lithic    | Grazing |
| 181 | -23,357052 | 29,776098 | Avalon    | 18 | 26 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 750  | Lithic    | Grazing |
| 182 | -23,357252 | 29,780292 | Clovelly  | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 850  | Lithic    | Grazing |

|     |            |           |           |    |    |              |              |      |                   |         |
|-----|------------|-----------|-----------|----|----|--------------|--------------|------|-------------------|---------|
| 183 | -23,358544 | 29,78426  | Nkonkoni  | 12 | 16 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 650  | Lithic            | Grazing |
| 184 | -23,359659 | 29,788278 | Glenrosa  | 22 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic            | Grazing |
| 185 | -23,361181 | 29,792191 | Cartref   | 18 | 24 | 7.5YR<br>3/3 | 10YR 6/2     | 300  | Lithic            | Grazing |
| 186 | -23,364745 | 29,790519 | Avalon    | 18 | 26 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 800  | Lithic            | Grazing |
| 187 | -23,368197 | 29,788596 | Avalon    | 12 | 16 | 7.5YR<br>4/3 | 7.5YR<br>4/4 | 900  | Hard Rock         | Grazing |
| 188 | -23,371691 | 29,786879 | Longlands | 12 | 14 | 7.5YR<br>3/3 | 10YR 6/2     | 750  | Lithic            | Grazing |
| 189 | -23,375136 | 29,743243 | Glenrosa  | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Lithic            | Grazing |
| 190 | -23,370991 | 29,743293 | Hutton    | 13 | 17 | 2.5YR<br>3/3 | 2.5YR<br>3/4 | 1200 | -                 | Grazing |
| 191 | -23,367036 | 29,743312 | Coega     | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Hard<br>Carbonate | Grazing |
| 192 | -23,363085 | 29,743359 | Glenrosa  | 12 | -  | 2.5YR<br>3/3 | -            | 250  | Lithic            | Grazing |
| 193 | -23,359324 | 29,743363 | Mispah    | 12 | -  | 7.5YR<br>3/3 | -            | 250  | Hard Rock         | Grazing |

## APPENDIX 2 – 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

Proposed Bethel Solar PV, Draailoop Solar PV, Klippot Solar PV and Makoppa Solar PV in the Makhado Local Municipality in the Vhembe District, Limpopo 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 Impact Assessment          |
| Specialist Company Name                | TerraAfrica Consult (Pty) Ltd           |
| Specialist Name                        | Mariné Pienaar                          |
| Specialist Identity Number             | 8207250025080                           |
| Specialist Qualifications:             | MSc. Environmental Science, BSc. Agric. |
| Professional affiliation/registration: | SACNASP ; SSSSA                         |
| Physical address:                      | Farm Strydpoort, Ottosdal, 2610         |
| Postal address:                        | 30 Joubert Street                       |
| Postal address                         | Wolmaransstad, 2630                     |
| Telephone                              | 082 828 3587                            |
| Cell phone                             | 082 828 3587                            |
| 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 (Pty) Ltd

Name of Company:

08 Jul 2025

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 (Pty) Ltd

Name of Company

08 Jul 2025

Date



Signature of the Commissioner of Oaths

08 Jul 2025

Date

 08/07/2025  
Commissioner of Oaths (RSA)  
Stephanus Francois Kasselmann  
59 Kruger street Wolmaransstad 2630  
T: 018 596 1320 F: 018 596 1395

## APPENDIX 3 - CURRICULUM VITAE OF SPECIALIST

# MARINÉ PIENAAR

## Specialist Scientist



+2782-828-3587



mpienaar@terraafrica.co.za



linkedin.com/in/marinepienaar

Wolmaransstad,  
South Africa

### EXPERTISE

Soil Quality Assessment

Soil Policy and Guidelines

Agricultural Agro-  
Ecosystem Assessment

Sustainable Agriculture

Data Consolidation

Land Use Planning

Soil Pollution

Hydrogeology

### 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 Booyssendal 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 (SSSA)

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
- Italtai 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



NATALIA RODRIGUEZ EUGENIO  
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RENEE JANSE VAN RENSBURG  
Environmental Manager  
CIGroup  
+2782-496-9038  
reneejvr@cigroup.za.com

|                                                                                                                                                                                                                                                                                           |                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <div style="text-align: center;"><br/><b>SACNASP</b><br/>South African Council for Natural Scientific Professions</div>                                                                                 |                                                                                                                          |
| <p><b>herewith certifies that</b></p> <p><b>Mariné Pienaar</b></p> <p>Registration Number: 400274/10</p> <p><b>is a registered scientist</b></p>                                                                                                                                          |                                                                                                                          |
| <p>in terms of section 20(3) of the Natural Scientific Professions Act, 2003<br/>(Act 27 of 2003)</p> <p>in the following field(s) of practice (Schedule 1 of the Act)</p> <p>Soil Science (Professional Natural Scientist)<br/>Agricultural Science (Professional Natural Scientist)</p> |                                                                                                                          |
| Effective <b>20 October 2010</b>                                                                                                                                                                                                                                                          | Expires <b>31 March 2026</b>                                                                                             |
|                                                                                                                                                                                                        |                                                                                                                          |
| <br>_____<br>Chairperson                                                                                                                                                                               | <br>_____<br>Chief Executive Officer |



05 December 2025

Attention : Dale Holder

Cape Environmental Assessment Practitioners

17 Progress Street

George

6530

Via email: dale@cape-eaprac.co.za

**RE: MITIGATED LAYOUTS FOR THE PROPOSED BETHEL SOLAR PV, DRAAILOOP SOLAR PV, KLIPPUT SOLAR PV, MAKOPPA SOLAR PV AND ASSOCIATED GRID CONNECTIONS SITUATED SOUTH-WEST OF LOUIS TRICHARDT IN THE MAKHADO MUNICIPALITY OF THE LIMPOPO PROVINCE.**

As the Author of the Agricultural Compliance Statement for the proposed Bethel Solar PV, Draailoop Solar PV, Klipput Solar PV and Makoppa Solar PV facilities and associated grid connection infrastructure, this letter serves to confirm that I have reviewed the mitigated layout plans for these facilities as dated 01 December 2025.

Based on a review of these mitigated layout plans, I confirm the following:

1. The changes to the layouts do not change the nature of significance of impacts already assessed in my studies.
2. The changes to the layouts do not change the EMPr outcomes or mitigation measures outlined in my report.
3. The changes to the layouts do not change the significance of the mitigation measures outlined in my report.

For each project, the development footprint has been reduced, resulting in more Large Stock Units that remain available for game farming and livestock grazing. The change in

development footprint and the resulting number of Large Stock Units that will remain unaffected because of it are summarised below:

| <b>Project name</b> | <b>Initial development footprint (ha)</b> | <b>New development footprint (ha)</b> | <b>Additional area excluded from the development footprint (ha)</b> | <b>Grazing/forage available in the additional area that is excluded from the development footprint (LSU)</b> |
|---------------------|-------------------------------------------|---------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Bethel Solar PV     | 623.9                                     | 505.9                                 | 118                                                                 | 13                                                                                                           |
| Draailoop Solar PV  | 855.1                                     | 582.6                                 | 272.5                                                               | 30                                                                                                           |
| Klipput Solar PV    | 599.9                                     | 503.9                                 | 96                                                                  | 11                                                                                                           |
| Makoppa Solar PV    | 340.4                                     | 252.5                                 | 87.9                                                                | 10                                                                                                           |

All other findings and recommendations in my report remain equally applicable to the revised layout plans dated 01 December 2025.

Sincerely,

Mariné Pienaar

Agricultural Specialist.