*BASIC ASSESSMENT*

# PROPOSED CONSTRUCTION AND IMPLEMENTATION OF HARI PV DEVELOPMENT, NEAR UPINGTON, NORTHERN CAPE

## Applicant: Hari PV (Pty) Ltd

AGRICULTURAL ASSESSMENT REPORT
JUNE 2020

*STUDY CONDUCTED BY: C R LUBBE*


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# 1. INTRODUCTION

Hari PV (Pty) Ltd is applying for authorisation to construct a 100 Megawatt PV facility, to be known as Hari PV. The site is situated on Geel Kop Farm 456 Remaining Extent the ZF Mgcawu District of the Northern Cape Province, in the Kai Garib Local Municipality and ±25 km west of Upington. The total size of the farm is 4117.3628 ha and the development is calculated to cover 252 ha of this area.

The project intend to connect from the onsite sub-stations to the Upington MTS (400/132 kV), via the 132kV Geelkop Collector Substation (this basic assessment process only includes the IPP portion of the onsite sub-station, while the remainder of the grid connection is being assessed in a separate BAR process.

The objectives of this study were to consider possible temporary and permanent impacts on agricultural production that may result from the proposed construction and operation of Hari PV.

# 2. APPROACH AND METHODOLOGY

The approach was to compile a natural resource database for the study area. This would include all necessary information to determine the agricultural potential and risks for farming on this land unit. The proposed development would then be considered in terms of possible impacts it may impose on agricultural production of the unit and on the surrounding area.

The resource data was obtained from published data (AGIS) and then compared to a field survey done on 25-27 February 2020.

# 3. ASSUMPTIONS AND UNCERTAINTIES

Regional information was mainly obtained through a desktop study. Climatic conditions, land use, land type and terrain are readily available from literature, GIS information and satellite imagery. This information was verified by the field survey.

The site was visited at the end of the summer, which provided good conditions for augering and veld evaluation. The basal cover showed a lovely yellow carpet. However, "all that glitters is not gold" and the yellow areas, infested with Duwweltjies (*Tribulus terrestris*), are actually an indication of bare soil land cover.

# 4. DESCRIPTION OF THE PROPOSED PROJECT

Hari PV is to consist of solar photovoltaic (PV) technology, fixed-tilt single-axis tracking- or dual-axis tracking-mounting structures, with a net generating capacity of 100 MW. Associated infrastructure will include:

- On-site switching-station / substation; which will connect at 132kV to the Upington MTS.
- Auxiliary buildings (gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Inverter-stations, transformers and internal electrical reticulation (underground cabling);
- Access and internal road network;

- Laydown area;
- Rainwater tanks;
- Electrified perimeter fencing; and
- Security infrastructure.

# 5. THE POTENTIALLY AFFECTED ENVIRONMENT

This section provides a general description of the immediate environment potentially affected by the construction, operation and closure of the proposed PV power plant.

## 5.1 Locality

The site is located on Geel Kop Farm 456, remaining extent, situated in the ZF Mgcawu District of the Northern Cape Province, in the Kai Garib Local Municipality. Access to the site is from the N14, approximately 26km south-west of Upington. The study area is 252 ha with the development footprint approximately 240 ha - see Figure 1. In Figure 2, the proposed layout of the facility is illustrated.

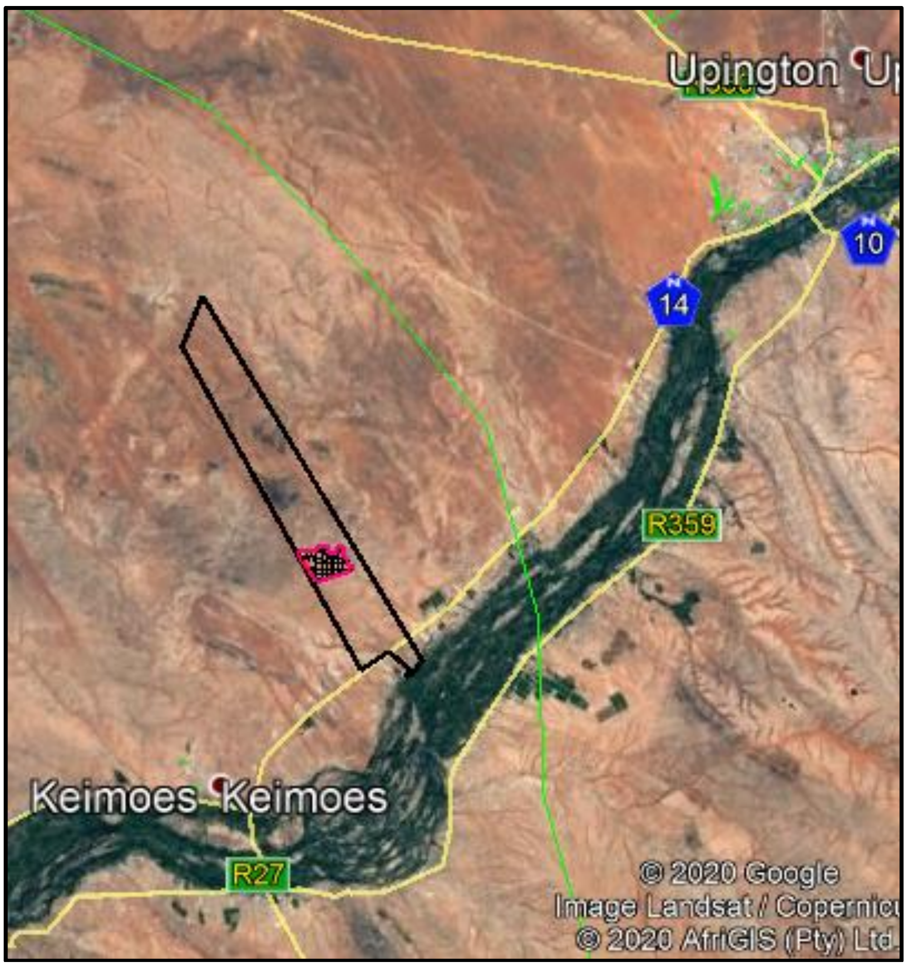
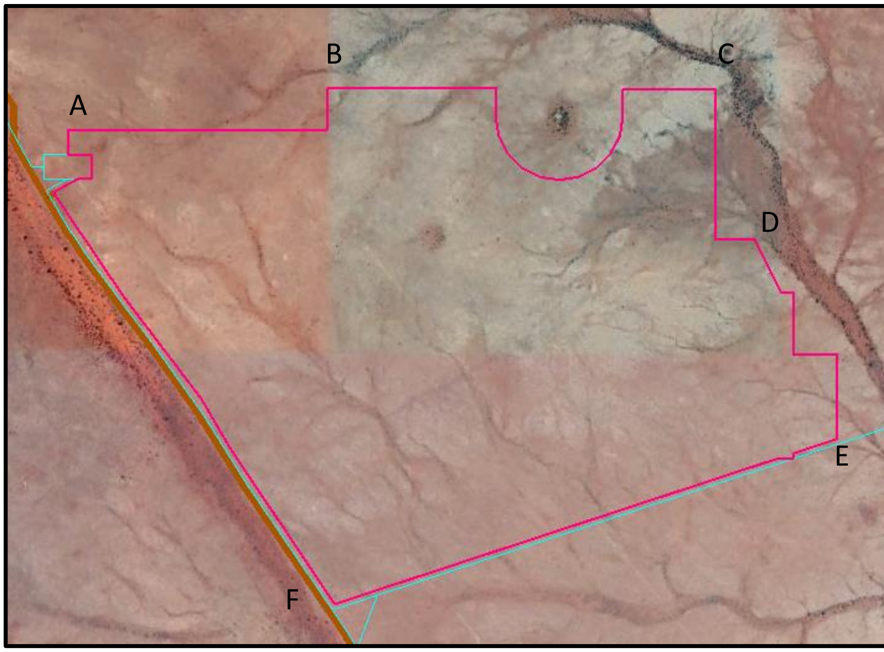



***Figure 1: Location of the proposed Hari Solar PV***



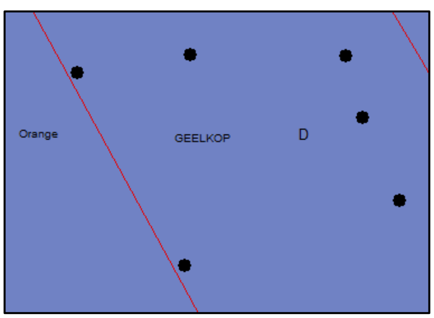

| Points | Latitude | Longitude |
|---|---|---|
| A | 28.603023 | 21.003569 |
| B | 28.601829 | 21.012316 |
| C | 28.601886 | 21.024367 |
| D | 28.606095 | 21.025663 |
| E | 28.611727 | 21.028515 |
| F | 28.616107 | 21.011926 |

***Figure 2: Proposed Layout of Site***

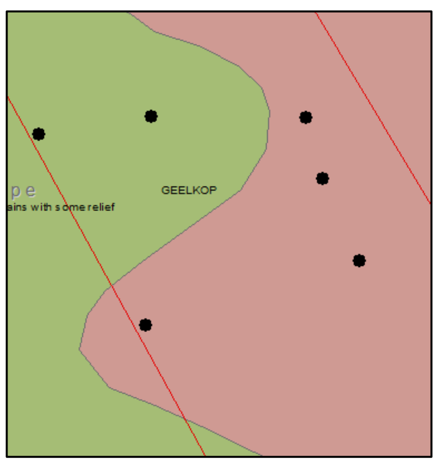
## 5.2 Natural Physical Data

A desktop study was carried out, using thematic maps with a 250 000 scale. The natural physical data thus obtained is set out in Figure 3.

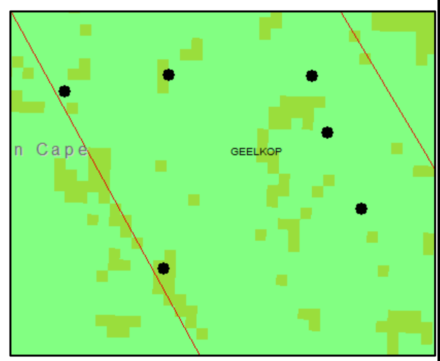
**Hari PV physical data (AGIS)**



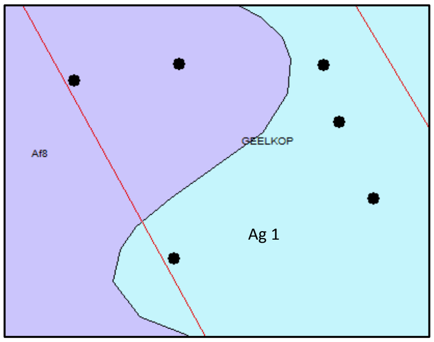

Water management area D 73 F Orange River



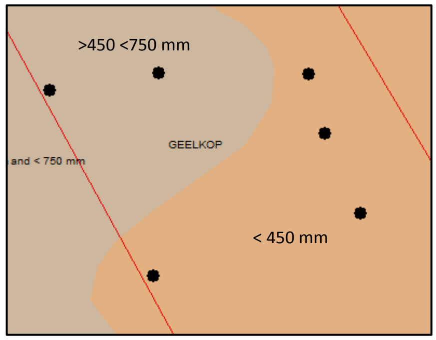

Terrain Type Rolling or irregular plains with some relief (Green) and Level plains with some relief (Purple)



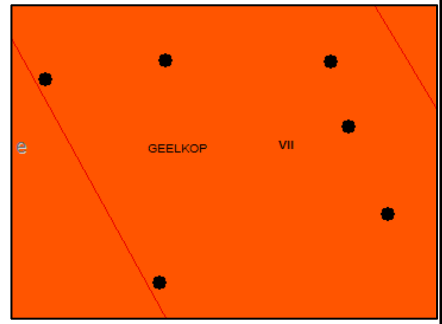

Average Slope : Majority of area <2% with some 2 -5 %



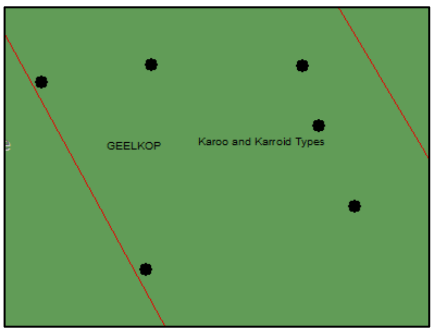

Land Type Map Ae 10 (Blue) and Af 8 (Purple) Ag1 Turqouise



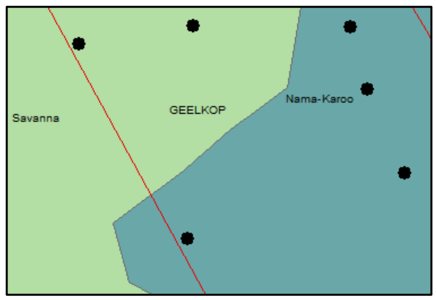

Soil Depth >=450 mm < 750 mm



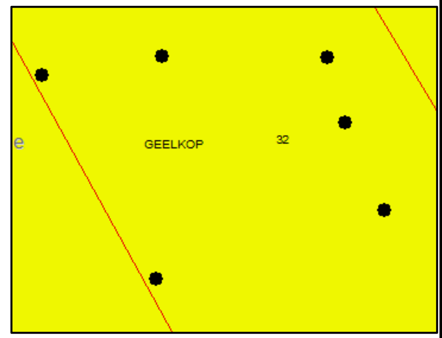

National Land Capability VII Grazing Woodland or Wild live



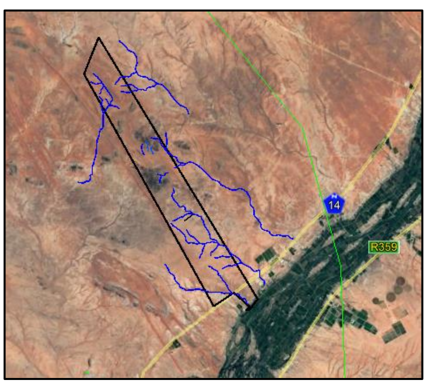

Acocks Veld Type: Karoo and Karroid types



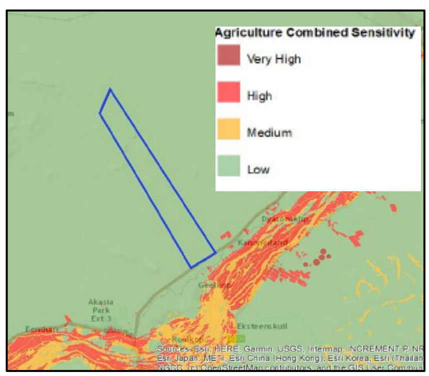

Vegetation Biomes Savanna (Green) Nama Karoo (Blue)



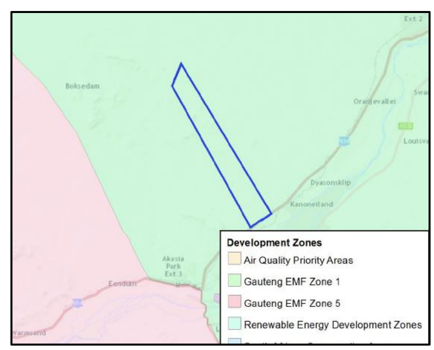

Grazing capacity 32 ha/LSU




Erosion Sensitivity: Drainage lines




Agricultural Combined Sensitivity Low




Development Zones: Renewable Energy Development

***Figure 3: Thematic maps***

### 5.3 Drainage

The site lies in Quarternary catchment D73F of the Gariep River. The effected area is positioned on a lower midslope with level plains. The slope gradient is less than 5%. Storm water is diverted to two well-defined drainage lines west and east of the site and caught in depressions or small pans.

### 5.4 Topography

The terrain type is labelled as Rolling or irregular plains with some relief and Level plains with some relief. . The average Slope of the larger area is <2% with some 2-5 %.

### 5.5 Land cover

Characteristic of the environment is the narrow strip known as the Gariep river valley between the physiographic regions Southern Kalahari and Bushmanland. Intensive cultivation takes place on the alluvial soils in this buffer around the Gariep River. The intensive cultivated area bordering the Gariep on this farm is ±14 ha. The rest is used for extensive livestock farming.

### 5.6 Vegetation

The site is situated in the Nama Karoo Bushmanland region. In general, the vegetation is an open shrub land, dominated by small woody shrubs and white Bushman Grass species (*Stipagrostis)*. Succulents occur in some areas. Trees and bigger shrubs are mostly confined to rocky areas, but there are some woody plants on the plains, especially where the soils are shallow, along drainage lines or seasonal watercourses. On the flats, the *Rhigozum* species and *Rhus* species tend to be more common. The area falls in the transition between Kalahari Karroid Shrubland and Bushmanland Arid Grasslands.

The grazing capacity is low at 32 hectares per large stock unit (LSU). The Normalised Difference Vegetation Index (NDVI) is low.[1]

### 5.7 Climate

The region is classified as an arid zone with desert climate. Specific parameters are shown in Table 1Table 4.

***Table 1: Climatic information of the area***

| | |
|---|---|
| **Rainfall** | |
| Annual rainfall | 161 mm |
| Summer rainfall | <62.5mm |
| Winter rainfall | <62.5mm |
| Variation in rainfall | 40 to 50% |
| **Temperature** | |
| Mean maximum temperature | >35ºC |
| January Temperature | >27.5ºC |
| Mean minimum temperature | 2-4ºC |
| July temperature | <7.5ºC |
| Temperature range | >15ºC |
| First frost expected | 21-31 May |
| Last frost expected | 01-10 September |
| Hours of sunshine | >80% |
| Evaporation | >2400mm |
| Humidity | <30% |

[1] *NDVI refers to a mathematical formula applied to satellite imagery to provide information on plant activity or vigour. It is an indicator of active vegetation cover.*

### 5.8 Geology

The area lies in the Kalahari geological group of the Namaqualand metamorphic complex. This is the youngest of the geological groups formed in the past 65 million years.

The lithology (mineralogical composition and texture of rocks) of this area consists of:

***Sand:*** During a very dry period in Southern Africa some 100 000 years ago sand was transported from the Namib dessert by strong and continuous winds and distributed over the Kalahari.

***Limestone:*** Limestone is a sedimentary rock consisting largely of calcium carbonate, which is usually derived from the shells of minute marine or fresh-water animals. Sand, clay and minerals such as magnesia or iron oxide are also present.

Sedimentary and Volcanic rocks (parent material of soils) found in the area include Migmatite, Schist, Gneiss and granite.

***Soil:*** The dominant land type is:

**Ae 108:** red soils with high base status >300mm deep, no dunes;

**Af 8:** red high base status >300 mm deep soils with dunes;

**Ag 1:** red high base status <300 mm deep soils.

AGIS indicates the typical profile for soils in this region as follows:

- Soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils;
- Lime generally present in part or most of the landscape;
- Red and yellow well drained sandy soil with high base status;
- Freely drained, structure less soils;
- Favourable physical properties; and
- Soils may have restricted soil depth, excessive drainage and high erodibility.

## 6. SOIL

### 6.1 Soil Profile Description

On 25 to 27 February 2020, the site was visited to conduct a field study.

A soil augering survey was carried out, assigning a unique number to each augering point and capturing the physical and morphological information on a coding sheet. The observation points, their coordinates and results are shown in Figure 4.

The method used to determine agricultural soil potential was to auger on ± 200 m interval along the borders with diagonal coverage.

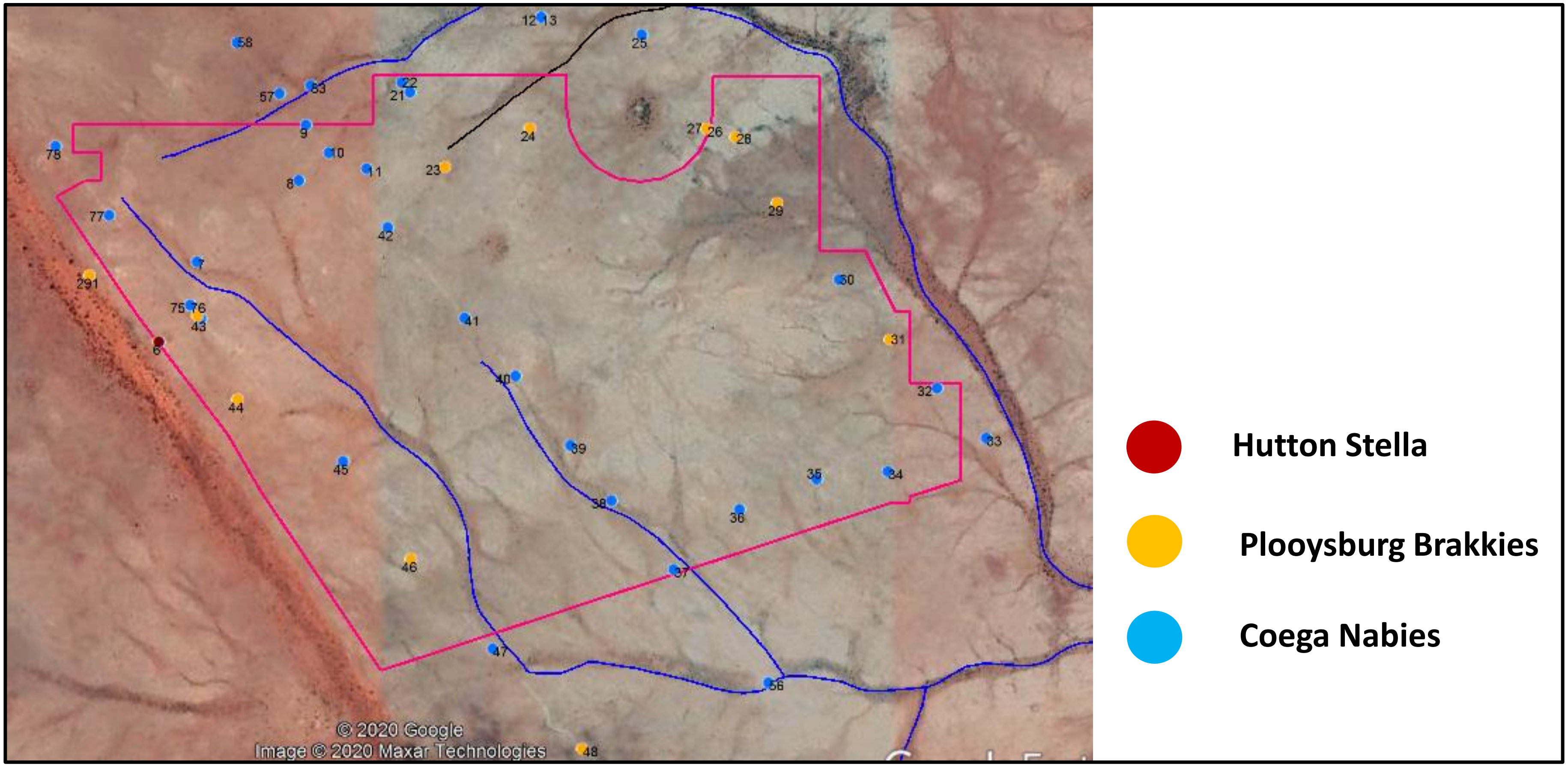



*Figure 4: Soil survey*

At each observation point soil, terrain, vegetation and erosion were noted. Table 2 presents the details of three such observations, representative of the whole area.

***Table 2: Soil Observations***

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OBS | 29 | COMMENT | | Pan | | | | | | | | | | | |
| LAT | 28.60483 | SLOPE GRAD | | 2 | | | MOISTURE | | | | | | | | |
| LONG | 21.02323 | SLOPE SHAPE | | V | | | EROSION | | | | | | | | |
| | FORM | Py | TSD | 60 | WET | 0 | HOR | TYPE | DEPTH | COL | CLAY | S-GR | CONS | STRUC | STONE |
| | FAM | 1000 | ESD | 60 | C | l | 1 | A | 20 | 10R4/6 | 6 | f | 5 | sg | 0 |
| | ROUGH | 2 | ASD | 60 | GEO | D4 | 2 | B | 61 | 10R4/6 | 6 | f | 5 | a | 0 |
| | TERR_POS | 5 | LTN | h | PHOTO | | 3 | | | | | | | | |
| | L.COVER/USE: | Shephard tree and Three thorn low grass cover | | | | | | | | | | | | | |
| | VIS.VELD.COND | A | 1 | B | 4 | C | 1 | D | 4 | E | 2 | TOTAL | 12 | | |

| **Soil Properties** | **A Horizon Topsoil** | **B Horizon Sub-soil** | **C-Horizon Sub-strata** |
|---|---|---|---|
| Texture | Fine sand | Fine sand | Rock |
| Consistency | Loose to very loose | Loose to very loose | |
| Structure | Single grain | Apedal | |
| Colour | Red | Red | |
| Horizon Depth | 200mm | 600mm | >700mm |
| Depth limitation | Hard setting horizon | | |
| Effective Depth | 600mm | | |
| Terrain position | Riparian zone | | |
| Geology | Undifferentiated basic rock | | |
| Slope shape | Concave | | |
| Slope gradient | 2 % | | |
| Moisture availability | Low | | |
| Erosion potential | High | | |
| Soil Form | Plooysburg | | |
| Soil Family | Brakkies | | |
| Land cover and use | Medium *Rhigozum* infestation with poor grazing grasses mainly marsh type annual. Rock outcrop and low Karoo bush cover. Used for grazing. Slight levels topsoil loss. | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OBS | 36 | COMMENT | | | | | | | | | | | | | |
| LAT | 28.61234 | SLOPE GRAD | | 2 | | | MOISTURE | | L | | | | | | |
| LONG | 21.02216 | SLOPE SHAPE | | R | | | EROSION | | M | | | | | | |
| | FORM | Cg | TSD | 10 | WET | 0 | HOR | TYPE | DEPTH | COL | CLAY | S-GR | CONS | STRUC | STONE |
| | FAM | 1000 | ESD | 10 | C | l | 1 | A | 20 | 10R4/6 | 6 | f | 5 | sg | 10R4/6 |
| | ROUGH | 2 | ASD | 10 | GEO | D4 | 2 | | | | | | | | |
| | TERR_POS | 3 | LTN | h | PHOTO | | 3 | | | | | | | | |
| | L.COVER/USE: | Low groundcover surface carbonate | | | | | | | | | | | | | |
| | VIS.VELD.COND | A | 1 | B | 4 | C | 1 | D | 4 | E | 2 | TOTAL | 12 | | |

| **Soil Properties** | **A Horizon Topsoil** | **B Horizon Sub-soil** | **C-Horizon Sub-strata** |
|---|---|---|---|
| Texture | Fine sand | Massive | Hardpan Carbonate |
| Consistency | Loose to very loose | Very solid and hard | |
| Structure | Single grain | Hard setting horizon | |
| Colour | Red | Off white | |
| Horizon Depth | 200mm | >300mm | >500mm |
| Depth limitation | Hardpan Carbonate hard setting | | |

| | |
|---|---|
| Effective Depth | 200mm |
| Terrain position | Lower mid slope |
| Geology | Undifferentiated basic rock |
| Slope shape | Regular |
| Slope gradient | < 5 % |
| Moisture availability | Low |
| Erosion potential | High |
| Soil Form | Coega |
| Soil Family | Nabies |
| Land cover and use | Medium *Rhigozum* infestation with poor grazing grasses and medium Karoo bush cover. Surface carbonate |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OBS | 44 | COMMENT | | | | | | | | | | | | | |
| LAT | 28.61116 | SLOPE GRAD | | 2 | | | MOISTURE | | I | | | | | | |
| LONG | 21.01667 | SLOPE SHAPE | | R | | | EROSION | | M | | | | | | |
| | FORM | Py | TSD | 30 | WET | 0 | HOR | TYPE | DEPTH | COL | CLAY | S-GR | CONS | STRUC | STONE |
| | FAM | 1000 | ESD | 30 | C | I | 1 | A | 20 | 10R4/6 | 6 | f | 5 | sg | 0 |
| | ROUGH | 2 | ASD | 30 | GEO | D4 | 2 | B | 30 | 10R4/6 | 6 | f | 5 | a | 0 |
| | TERR_POS | 3 | LTN | h | PHOTO | | 3 | | | | | | | | |
| | L.COVER/USE: | Low Three thorn Karoo bush vlei grass | | | | | | | | | | | | | |
| | VIS.VELD.COND | A | 1 | B | 4 | C | 1 | D | 4 | E | 2 | TOTAL | 12 | | |

| **Soil Properties** | **A Horizon**<br>**Topsoil** | **B Horizon**<br>**Sub-soil** | **C-Horizon**<br>**Sub-strata** |
|---|---|---|---|
| Texture | Fine sand | Fine sand | Hardpan<br>Carbonate |
| Consistency | Loose to very loose | Loose to very loose | |
| Structure | Single grain | Single grain | |
| Colour | Red | Red | |
| Horizon Depth | 200mm | 400 mm | >500mm |
| Depth limitation | Hardpan Carbonate hard setting | | |
| Effective Depth | 400 mm | | |
| Terrain position | Lower mid slope | | |
| Geology | Undifferentiated basic rock | | |
| Slope shape | Regular | | |
| Slope gradient | < 5 % | | |
| Moisture availability | Low | | |
| Erosion potential | High | | |
| Soil Form | Plooysburg | | |
| Soil Family | Brakkies | | |
| Land Cover | Karoo bush marsh type of grass | | |

### 6.2 Summary of soil potential

Because of the similarity in soil properties above the soil-limiting layer, the single variable to determine soil potential is effective soil depth. Increments of 300 mm in soil depth were used as parameter for soil group classes. A colour code as shown in Figure 5 is used to identify each observation point on the soil map.

### 6.3 Effective depth

Based on the distribution of effective depths found in the study area, the ratio is predicted in Table 3. This ratio concurs with the survey as a whole.

***Table 3: Soil effective depth classes***

| Group | Percentage | Area (240 ha) |
|---|---|---|
| 601 - 900 mm | 6 | 14 |
| 301- 600 mm | 20 | 48 |
| 0 – 300 mm | 75 | 180 |

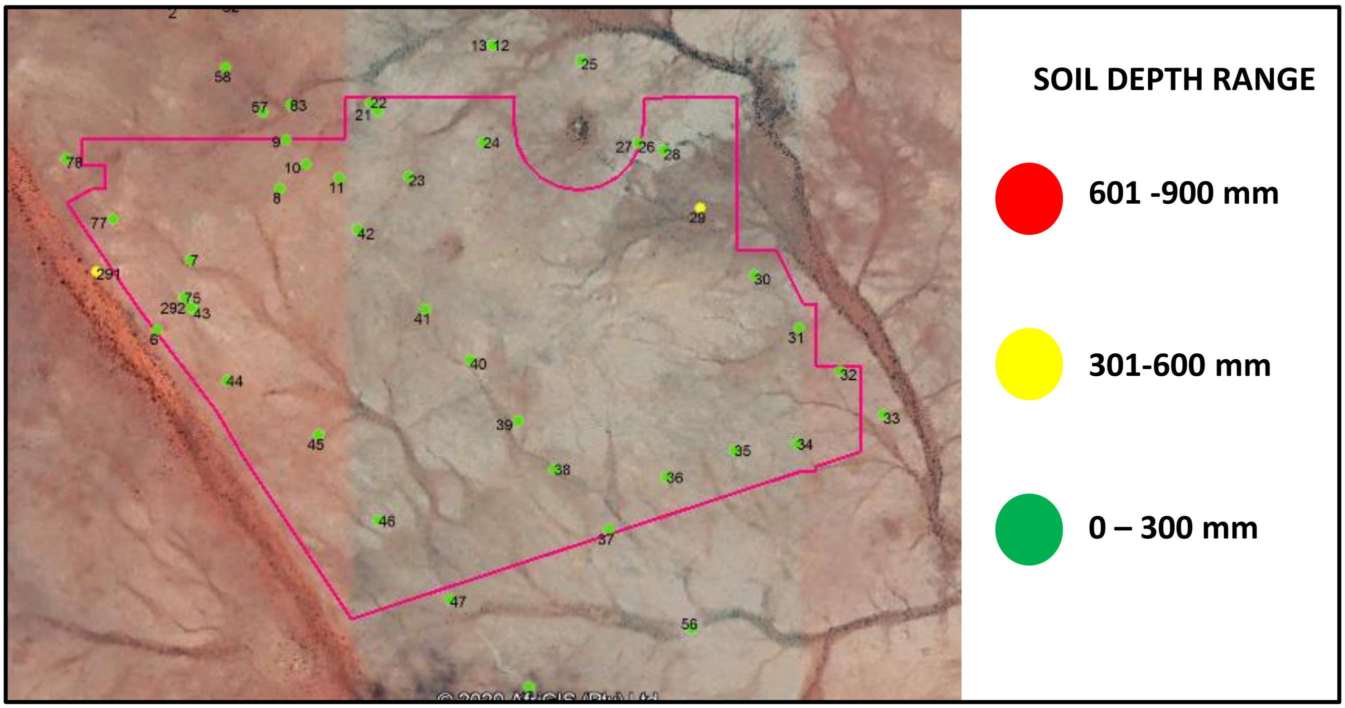



***Figure 5: Effective depth classes***

### 6.4 Texture

The clay content of the top horizon is 6% and the sub-horizon is 6- 8% with medium sand grade. The texture class is sand.

The sand grade of top soil influences the stability and erodibility potential.

A low clay percentage results in low water holding capacity.

### 6.5 Structure

The soil profile is very weakly structured, single grain with a loose consistency. The permeability or drainage through the profile is very fast. The organic matter content is low.

### 6.6 Depth Limiting layers

Cultivation is restricted by the outcrop of or close to surface gravel, rock and hard setting layers, which prohibit root development and poses risks to farming implements. Depending on the thickness of these layers, it is possible to ameliorate the soil depth. Such action is only justifiable if the crop to be established is highly profitable and irrigation water is available

### 6.7 Land cover

The land is covered sparsely with large bare areas. Poor grazing grasses, Karoo bush and three-thorn Rhigozum bushes represent the basal cover. Moderate to severe levels of erosion and soil loss were noted. Supporting images of the area, marked in accordance with observation point numbers, are shown in Figure 6. The observation points can be identified on the map in Figure 4.

***8***

***29***

***31***

***36***

**41**

**44**

***Figure 6: Imagery of the surveyed area.***

## 7. LAND CAPABILITY FOR AGRICULTURE

Land capability involves considering the risk of land damage from erosion and other causes, the difficulties in cultivation because of physical land characteristics and climatic conditions.

The potential agricultural capability of the site is largely unsuitable for cultivation, based on the natural resources present, including the following limiting factors:

- Low annual rainfall, high evaporation and extreme temperatures restrict dry land cultivation;
- The very shallow soil depth with its limited water holding capacity restricts root development;
- The sand grade of top soil influences the stability and increases erodibility potential; and
- Low clay percentage results in low water holding capacity.

***Erosion Potential***

In this arid climate, the erosivity (the potential ability of rain to cause erosion) is low, but the erodibility (vulnerability of the soil to erosion) is high due to the low clay percentage and shallow soil depth. Possible erosion caused by water is low, due to the characteristics of the terrain, i.e.:

- Low annual rainfall
- Regular slope of 2 %
- Length of slope is short
- Small catchment area, because water drain naturally away from the ridge.

The risk of erosion caused by wind is high, due to the low clay percentage of the soil and the fact that the soil is usually dry - therefore prone to blow away. To combat this erosion, vegetation is needed, but the severe climatic conditions prevent possible mechanical conservation measures. However, this erosion risk already exists and the proposed grid connection lines will have a low impact.

## 8. PAST AND CURRENT AGRICULTURAL ACTIVITIES ON SITE AND THE REGION

The site is currently utilised for extensive livestock farming. The livestock comprises of a small herd of cattle. Boer goats were initially farmed with in the past as the nameplate at the farm entrance suggest. Due to animal theft and control of wild animals praying on them, stopped this venture. There is no evidence of past or current cultivation on the site. Current structures on site include internal fencing and stock watering provision. The watering and handling facilities are of good quality and design. Each camping unit is provided for. The reason for abandoning the Boerbok enterprise is not because of the farmer's ability or enthusiasm as can be seen of these facilities.

Cattle farming take place, but due to the unfavourable carrying capacity, only a herd of less than 130 LSU is permissible. Game farming is also practised.

In an 18 km radius of Hari, only four vineyards were established north of the N14 and one south of the road. This is because of the high cost for installing irrigation and construction of the infrastructure – shown in Figure 7. The distance from the Gariep to Hari is 7 km. The image of observation point 8 shown in Figure 6 portrays the result of making a furrow to convey water from one pump to another.

The rest of the area is used for grazing with livestock.

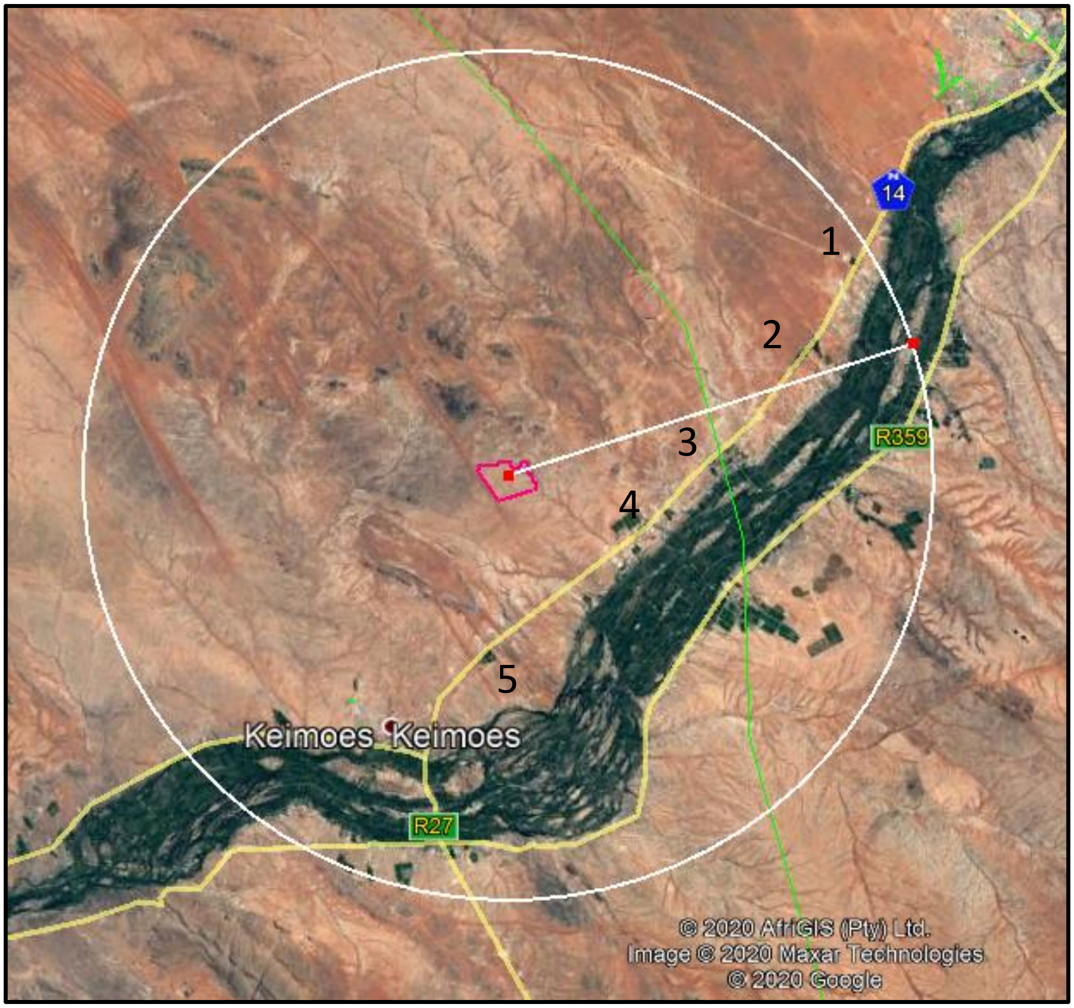



***Figure 7: Agricultural activities on the farm***

## 9. ACCESS ROAD

Access to Hari PV is gained from the N14, which is the existing entrance to the property. The alignment deviate here from the general farm road following the eastern border for ± 2 km then turn west for ±2.5 km to the western border. From here, the road continues ±2 km north to the site – see Figure 8.

This alignment is also proposed for the gridline.

The assessment focussed on the following criteria:

- Loss of high potential land;
- Erosion risks caused by altered drainage patterns resulting from construction;
- Deterioration of veld conditions due to clearing of vegetation (especially *Acacia Erioloba);*
- Stockpiling of building material;
- Diversion of natural water run-off;

- Loss of natural grazing.

No high potential soil will be lost as the land is classified as Capability Class VII which use is limited largely to pasture, range and woodland.

The drainage lines were mapped as sensitive area to be avoided with the positioning of structures. This was accomplished by planning only one crossing near the entrance. No diversion of the natural run off will take place .The dunes west of the road act as a berm to cut off flow, with the road on the crest. Run off will drain naturally east into depressions or drainage lines.

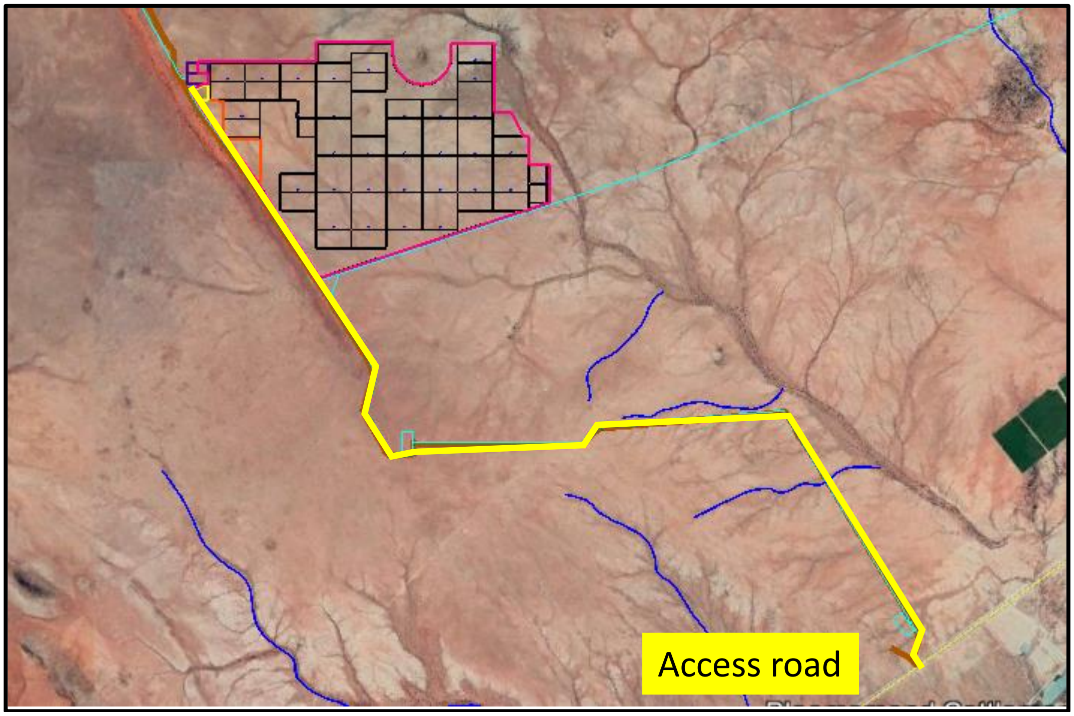



***Figure 8: Alignment of Access road***

The nature of the land, which has a high exposed carbonate or rocks, is due to accumulate rubble when disturbed. This must be prevented of mitigated.

Loss of grazing field will be low because of the low carrying capacity.

## 10. GRID CONNECTION LINE

The assessment of the grid connection line is the subject of a separate report and just briefly discussed here. Hari PV will be connected with overhead transmission lines on an alignment south on the western boundary and then west and parallel to the Eskom Aries 400 kV servitude – see Figure 9.

This route will cross the following properties:

- Remaining Extent Farm Geel Kop 456
- Portion 5 of Farm Bloemsmond 455
- Portion 14 of Farm Bloemsmond 455

- Remainder of Farm Dyasonsklip 454
- Remainder of Farm Rooipunt 617
- Remainder of Farm 638 Tungsten Lodge
- Olyvenhouts Drift Settlement Agricultural Holding, Holding Number 1080, Portion


***Figure 9: Alignment of the Gridline***

Soil and vegetation is of very low agricultural value. Predominately the soil is less than 500 mm deep, limited by rock or hard carbonate sub strata with a sandy texture. Large areas of surface rocks appear. The plant cover is sparse with large bare areas. Grasses have poor grazing value and medium encroachment of *Rhigozum Trichotomum* were noted

Crossing of riverbeds or drainage lines requires the prevention of erosion and the removal of *Acacia Erioloba* should be avoided.

## 11. ASSESSMENT OF PROPOSED DEVELOPMENT

The development proposed is to construct a commercial photovoltaic (PV) solar energy facility (SEF) on ± 240 ha agricultural land. The approximate area that each component of the SEF will occupy is summarised in Table 4.

***Table 4: Components of the development***

| **SEF Component** | **Estimated Area** | **% of Development Area (240 ha)** | **% of Farm Area 4117.3628 ha** |
|---|---|---|---|
| PV Structures/modules | 231.5 | 96.5 | 5.60. |
| Internal roads | 6.5 | 2.7 | 0.18 |
| Auxiliary buildings | 1.5 | 0.6. | 0.04 |
| Substation | 0.5 | 0.2 | .01 |
| Total | 240 | 100 | 5.83 |

From the estimate above, the potential impacts that the facility may have on agricultural development of the farm, are:

### 11.1 Loss of agricultural land

The land is classified as Capability Class VII, which limits its use largely to pasture, range and woodland. Continuing limitations that cannot be corrected include:

- Severe erosion hazard;
- Stoniness;
- Shallow rooting zone;
- Low water holding capacity;
- Severe climate.

The DEA Screening tool calculated the site with low Agricultural Combined Sensitivity which concur with the Capability class rating.

The farm is used for livestock farming.

The total size of the farm is 4117.3628 ha**,** with a carrying capacity of 32 ha /LSU, so 129 large stock units are the maximum animals allowed for sustained grazing on the farm.

The proposed PV facility will have a footprint of 240 ha, which means a loss of 8 large stock units.

### 11.2 Erosion and change of drainage patterns

With the construction, the removal of vegetation makes the area vulnerable to wind erosion. Mitigating measures should be put in place to control possible erosion. Change of drainage patterns should be addressed, although the flat slope and high infiltration rate ensure a low risk for it to happen.

### 11.3 Pollution

During construction of all the components possibe spillages of concrete and fuel may pollute the soil.

## 12. POTENTIAL IMPACTS ON THE AGRICULTURAL ENVIRONMENT

### 12.1 Methodology to assess impacts

Potential impacts of the proposed project on agriculture were identified and evaluated. Impacts identified through the study were rated 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 a score is assigned:
  - 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)
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes
- The probability of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen)
  - Assigned a score of 2 is improbable (some possibility, but low likelihood)
  - Assigned a score of 3 is probable (distinct possibility)
  - Assigned a score of 4 is highly probable (most likely)
  - Assigned a score of 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).

### 12.2 Possible impacts during construction

| | | |
|---|---|---|
| Soil pollution with contaminants during the construction phase may take place, including spillages of hydrocarbon (fuel oil) and cement. This is possible during the construction of all facets of the facility: laydown area, concrete foundations of the auxiliary buildings, inverter stations subterranean cabling, main access and internal service roads. | | |
| | **Without mitigation** | **With mitigation** |
| Extent | Local (1) | Local (1) |
| Duration | Medium Term (2) | Very short (1) |
| Magnitude | Low (4) | Minor(2) |
| Probability | Probable (3) | Probable(3) |
| Significance | **Low (21)** | **Low (12)** |
| Status (Positive or negative) | Negative | Negative |
| Reversibility | Partly reversible | Fully reversible |
| Irreplaceable loss of Resources | Yes | Yes |
| Can impacts be mitigated? | Yes | Yes |
| Mitigation: Refuelling normally takes place in the laydown area. Proactive measures must be taken which include constructing of a designated area where refuelling can take place. This area must have an impervious floor with low wall that will keep the spillage inside. This area should be cleaned with absorbent material on a regular basis. The use of cut-off drains must be incorporated to divert upslope clean storm water around the site into a natural drainage system. On the down slope, polluted water must be collected via a cut-off drain into a leachate collection and recovery system. When spillage accidently takes place, it should be removed and replaced with unpolluted soil. The clean soil can be sourced from excavations nearby. The polluted soil must be piled at a temporary storage facility with a firm waterproof base and is protected from inflow of storm water. It must have an effective drainage system to a waterproof spillage collection area. Contaminated soil must be disposed of at a hazardous waste storage facility. | | |
| Cumulative impacts: No, site-bound | | |
| Residual Risks: Yes, it is impossible to clear the affected area completely. | | |

| The establishment of the PV Solar facility will be done at the expense of agricultural land. The area to be lost for agricultural development would be 240 ha in size. This includes the area under PV panels, internal service roads and temporary laydown area. | | |
|---|---|---|
| | **Without mitigation** | **With mitigation** |
| Extent | Local – Regional (3) | Local (2) |
| Duration | Long-term (4) | Long-term (4) |
| Magnitude | Moderate (6) | Low (4) |
| Probability | Probable (3) | Improbable (2) |
| Significance | **Medium (39)** | **Low (20)** |
| Status (Positive or negative) | Negative | Negative |
| Reversibility | Low | Low |
| Irreplaceable loss of Resources? | No | No |
| Can impacts be mitigated? | Yes | Yes |
| **Mitigation:**<br>The general objective is to position the PV facilities on the lowest potential soil and not in places that may have impact on agricultural activities, drainage lines and places with a sensitive nature, such as protected tree species. Existing road alignments are followed and roads upgraded for use during the lifespan of the facility. With the appropriate planning, the same lifestyle can be maintained during the existence of the facility. | | |
| **Cumulative impacts:**<br>Impact is low due to agricultural potential of the locally. With increasingly adding of facilities, the impact will become more of significance if not mitigated. . | | |
| **Residual Risks:**<br>No, after decommissioning this impact will be reversed when rehabilitation has been completed. | | |

| The construction of a PV Solar facility will cause impairment of the land capability with the potential risk of erosion | | |
|---|---|---|
| | **Without mitigation** | **With mitigation** |
| Extent | Local (2) | Local (2) |
| Duration | Short term (2) | Short term (2) |
| Magnitude | Low (6) | Low (4) |
| Probability | Probable (3) | Probable (3) |
| Significance | **Medium(30)** | **Low (24)** |
| Status (positive or negative) | Negative | Negative |
| Reversibility | Low | Low |
| Irreplaceable loss of resources? | Yes | Yes |
| Can impacts be mitigated? | Yes | Yes |
| ***Mitigation:*** Clear trees and bushes selectively, leaving grass un-disturbed. Use mechanised machinery when installing posts to eliminate need for foundations. Construct on alternate strips to combat possible erosion. | | |
| ***Cumulative impacts:***<br>No cumulative impacts are expected to occur, as all impacts will be site bounded. | | |
| ***Residual Risks:***<br>No. Effected areas will be rehabilitated, as the impact will only be applicable during construction phase. | | |

| The establishment of the PV Solar facility may alter drainage patterns with construction and cause erosion | | |
|---|---|---|
| | **Without mitigation** | **With mitigation** |
| Extent | Local (2) | Local (1) |
| Duration | Long term (2) | Long term (2) |
| Magnitude | Low (2) | Low (2) |
| Probability | Probable (2) | Probable (2) |
| Significance | **Low(12)** | **Low (10)** |
| Status (positive or negative) | Negative | Negative |
| Reversibility | Low | Low |
| Irreplaceable loss of resources? | Yes | Yes |
| Can impacts be mitigated? | Yes | Yes |
| ***Mitigation:*** Establish structures on the contour. Use grass strips to regulate flow speed | | |
| ***Cumulative impacts:*** No, all impacts will be site bounded. | | |
| ***Residual Risks:*** No. Effected areas will be rehabilitated when operation has ceased. | | |

## 12.3 Possible impacts during operational phase

| Soil pollution with contaminants during the operational phase may take place, including spillages of hydrocarbon (fuel oil) and cement. This is possible during the maintenance of the facility. | | |
|---|---|---|
| | **Without mitigation** | **With mitigation** |
| Extent | Local (1) | Local (1) |
| Duration | Long Term (4) | Long Term (4) |
| Magnitude | Low (2) | Minor(2) |
| Probability | Probable (2) | Probable(2) |
| Significance | **Low (14)** | **Low (14)** |
| Status (Positive or negative) | Negative | Negative |
| Reversibility | Partly reversible | Fully reversible |
| Irreplaceable loss of Resources? | Yes | Yes |
| Can impacts be mitigated? | Yes | Yes |
| Mitigation: Refuelling normally takes place in the workshop of the control building. A designated area for refuelling must be constructed with an impervious floor and low wall that will keep the spillage inside. Any spillage must be cleaned with absorbent material as soon as possible and disposed into clearly marked containers. Where spillage takes place, contaminated soil must be excavated and replaced with unpolluted soil. The contaminated soil should be collected by a licenced landfill contractor. | | |
| Cumulative impacts: No, site-bound. | | |
| Residual Risks: Yes, It is impossible to clear the affected area completely. | | |

| The establishment of the PV Solar facility will be done at the expense of agricultural land. Area to be lost for agricultural development would be 240 ha in size. This includes the area under PV panels, internal service roads and temporary laydown area. | | |
|---|---|---|
| | **Without mitigation** | **With mitigation** |
| Extent | Local – Regional (3) | Local (2) |
| Duration | Long-term (4) | Long-term (4) |
| Magnitude | Moderate (6) | Low (4) |
| Probability | Probable (3) | improbable (2) |
| Significance | **Medium (39)** | **Low (20)** |
| Status (Positive or negative) | Negative | Negative |
| Reversibility | Low | Low |
| Irreplaceable loss of Resources? | No | No |
| Can impacts be mitigated? | Yes | Yes |
| **Mitigation:**<br>The general objective is to position the PV facilities on the lowest potential soil and not in places that may have impact on agricultural activities, drainage lines and places with a sensitive nature. Existing road alignments are followed and roads upgraded for use during the live span of facility. With the appropriate planning, the same live style can be achieved during the lease period of the facility from the land so occupied by the facility. | | |
| **Cumulative impacts:**<br>Impact is low due to agricultural potential of the locally. With increasingly adding of facilities, the impact will become more of significance if not mitigated. . | | |
| **Residual Risks:**<br>No, after decommissioning this impact will be reversed when rehabilitation has been completed. | | |

## 12.4 Possible impacts during decommissioning phase

All components of the facility should be dissembled and roads demolished. Rehabilitation should focus on:

- Demolish and removal of structures
- Demolish related roads
- Establish cultivation environment
- Stabilisation of erosion
- Reinstall camp fences and stock watering

| Soil pollution with contaminants during the decommissioning phase may take place, including spillages of hydrocarbon (fuel oil) and cement. This is possible during the decommissioning of all facets of the facility: laydown area, demolished concrete foundations of the auxiliary buildings, inverter stations subterranean cabling, main access and internal service roads. | | |
|---|---|---|
| | **Without mitigation** | **With mitigation** |
| Extent | Local (1) | Local (1) |
| Duration | Medium Term (2) | Very short (1) |
| Magnitude | Low (4) | Minor(2) |
| Probability | Probable (3) | Probable(3) |
| Significance | **Low(21)** | **Low (12)** |

| | | |
|---|---|---|
| Status (Positive or negative) | Negative | Negative |
| Reversibility | Partly reversible | Fully reversible |
| Irreplaceable loss of Resources? | Yes | Yes |
| Can impacts be mitigated? | Yes | Yes |
| Mitigation: Refuelling normally takes place in the workshop of the control building. A designated area for refuelling must be constructed with an impervious floor and low wall that will keep the spillage inside. Any spillage must be cleaned with absorbent material as soon as possible and disposed into clearly marked containers. Where spillage takes place, contaminated soil must be excavated and replaced with unpolluted soil. The contaminated soil should be collected by a licenced landfill contractor. | | |
| Cumulative impacts: No, site-bound. | | |
| Residual Risks: Yes, It is impossible to clear the affected area completely. | | |

# 13. CUMULATIVE IMPACT ASSESSMENT

When investigating the cumulative impact of similar developments, the most common concerns are

- Loss of agricultural land
- Altering drainage patterns
- Changing agricultural character to industrial

## 13.1 Loss of agricultural land

Similar facilities are not positioned on high potential soils. The criteria for high potential soil are:

- Land has few limitations that restrict its use;
- May be used safely and profitably for cultivated crops;
- Soils are nearly level and deep;
- Soil holds water well and are generally well drained;
- It is easily worked, and are either fairly well supplied with plant nutrients or highly responsive to inputs of fertilizers;
- When used for crops, the soil needs ordinary management practices to maintain productivity;
- The climate is favourable for growing many of the common field crops.

High potential soils are not expected in this region because of the low annual rainfall, high evaporation rate and extreme temperatures. Due to this climate, the soils are not highly leached, therefore high base status conditions exist. The limiting factor is not nutrient related but climate and shallow soil depth.

Calcium is another dissolved product of rock that will remain in the soil profile and form a cemented soil when water evaporates in the arid conditions. This soil layer limits water movement, root development and poses a mechanical restriction for cultivation.

### 13.2 Altering drainage patterns

The facility will be located in a low rainfall area with level topography and on soil with a very fast infiltration rate, from which a low runoff is expected. The flow direction of the surface run off, is in the same direction and parallel with the other facilities.

### 13.3 Changing agricultural character to industrial

The land cover have changed the last years and from only vineyards south of the N14 new establishments were erected on the northern side, which include vineyards as well as packaging stores and outlets for produce. The agricultural character became more industrial. The facility will have low visibility, being established 6.5 km from the N14.

### 13.4 Possible impacts

| The quantity of available soil for agricultural production decreases as result of the footprints of these facilities. The quality of soil decreases in the way the construction of these structures alters the workability of the soil. This includes the physical deformation in the soil profile. | | |
|---|---|---|
| | **Overall impact of proposed project considered in isolation** | **Cumulative impact of the projects in the area** |
| Extent | Local – Regional (1) | Regional(2) |
| Duration | Long Term (4) | Long Term (4) |
| Magnitude | Low(4) | Moderate (6) |
| Probability | Probable (3) | Probable (3) |
| Significance | **Low (27)** | **Medium (36)** |
| Status (Positive or negative) | Negative | Negative |
| Reversibility | Low | Low |
| Irreplaceable loss of Resources? | No | No |
| Can impacts be mitigated? | Yes | Yes |
| **Mitigation:** Ensure that most infrastructure features are erected on transformed or non-arable land. Implement stormwater management as an integral part of planning and as a guideline for the positioning of structures. Use existing roads and conservation structures to the maximum in the planning and operation phases. Rehabilitate disturbed areas as soon as possible after construction. | | |

| Clearing of vegetation increases flow speed and a lower infiltration tempo increases silt transport. | | |
|---|---|---|
| | **Overall impact of proposed project considered in isolation** | **Cumulative impact of the projects in the area** |
| Extent | Local (1) | Regional(2) |
| Duration | Long Term (4) | Long Term (4) |
| Magnitude | low (4) | Low (4) |
| Probability | Improbable (2) | Probable (3) |
| Significance | **Low (18)** | **Medium (30)** |
| Status (Positive or negative) | Negative | Negative |

| | | |
|---|---|---|
| Reversibility | Low | Low |
| Irreplaceable loss of Resources? | No | No |
| Can impacts be mitigated? | Yes | Yes |
| **Mitigation:** Erosion and sediment control with proper water run-off control planning. | | |

| Chemicals, hazardous substances and waste used or generated during live span of the facility accumulate and Pollute soil will become contaminated | | |
|---|---|---|
| | **Overall impact of proposed project considered in isolation** | **Cumulative impact of the projects in the area** |
| Extent | Local (1) | Regional(2) |
| Duration | Long Term (4) | Long Term (4) |
| Magnitude | low (4) | Low (4) |
| Probability | Improbable (2) | Probable (3) |
| Significance | **Low (18)** | **Medium (30)** |
| Status (Positive or negative) | Negative | Negative |
| Reversibility | Low | Low |
| Irreplaceable loss of Resources? | No | No |
| Can impacts be mitigated? | Yes | Yes |
| **Mitigation:** Mitigation measures stipulated in the Storm Water Management Plan must be undertaken. | | |

# 14. ENVIRONMENTAL MANAGEMENT PROGRAMME

The following should be included in the Environmental Management Programme:

| **Objective: Prevent and clean up soil pollution** | | |
|---|---|---|
| **Project components** | • PV energy facility<br>• Substation;<br>• Access roads;<br>• Power line;<br>• All other infrastructure (site camp, batching plant, etc). | |
| **Potential impact** | Pollution of soil by fuel, cement and other toxic materials | |
| **Activity/risk source** | Soil will become contaminated | |
| **Mitigation: Target/Objective** | All solid waste must be collected at a central location at each construction site and stored temporary until it can be removed to an appropriate landfill site in the vicinity. The target should be to minimise spillages and soil contamination. | |
| **Mitigation: Action/control** | **Responsibility**<br>Construction manager<br>Maintenance team | **Timeframe**<br>Lifespan of facility |
| **Performance Indicator** | No spillages | |
| **Monitoring** | Regular inspections of terrain and various infrastructure units. | |

| **Objective: Conservation of soil** | | |
|---|---|---|
| **Project components** | • PV energy facility<br>• Substation;<br>• Access roads;<br>• Power line;<br>• All other infrastructure (site camp, batching plant, etc). | |
| **Potential impact** | Erosion of revegetated land | |
| **Activity/risk source** | Soil get unusable and unproductive | |
| **Mitigation: Target/Objective** | Apply conservation measures. | |
| **Mitigation: Action/control** | **Responsibility**<br>Construction Manager<br>Maintenance team<br>Environmental manager | **Timeframe**<br>Lifespan of facility |
| **Performance Indicator** | No water run-off problems / erosion | |
| **Monitoring** | Regular inspections of terrain | |

## 15. CONCLUSION

With reference to applicable sections of the Regulations for Renewable energy in terms of Act 70 of 1970 and Act 43 of 1983, it can be stated that the proposed site will not suffer major agricultural impacts by the development. The reasons include aspects such as soil potential, geology, climate, loss of cultivating land and stock farming and other possible impacts.

The site does not have high agricultural potential because of the low annual rainfall, high evaporation rate, extreme temperatures and soil depth limitations.

Due to the limiting conditions, the site is classified as Class VII capability, in terms of which it is unsuited for cultivation and restricts utilisation to grazing, woodland or wildlife.

The land is currently used for livestock farming. The infrastructure required for such practice is still intact, but due to conditions not in control of the farmer, farming practice has changed from small stock to a small herd of cattle. Theft and insufficient control of wild beasts praying on livestock made small stock farming uneconomical. During the field study, a pack of at least five jackal was spotted, roaming the field freely.

Irrigation is not considered in the view of infrastructure cost and the limiting soil and environmental conditions.

With a farm size of 4117.3628 ha and carrying capacity of 32 ha per large stock unit (LSU), only 128 LSU can be carried on this farming unit.

The alignment of the access roads and grid connection will have a low impact on the environment if the required mitigation is applied.

The findings of this study indicate that the proposed power facility will have minimal impacts on agriculture, locally and on site, and will have very little influence on the current commercial farming.

The development site is located in the zone for Renewable Energy Development with the Agricultural Combined Sensitivity as rated low.

From an agricultural and land-use perspective, the application should be authorised.

Christo Lubbe

C R LUBBE 18 June 2020
AGRICULTURAL SPECIALIST

## LIMITATIONS

This Document has been provided subject to the following limitations:

(i) This Document has been prepared for the particular purpose outlined in it. No responsibility is accepted for its use in other contexts or for other purpose.

(ii) CR Lubbe did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the Document. Conditions may exist which were undetectable at the time of this study. Variations in conditions may occur from time to time.

(iii) Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted for incomplete or inaccurate data supplied by others.

(iv) This Document is provided for sole use by the client and its professional advisers and is therefore confidential. No responsibility for the contents of this Document will be accepted to any person other than the Client.

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**Appendix A**

# Curriculum Vitae - Christiaan Rudolf Lubbe

## KEY QUALIFICATIONS:

- National Higher Diploma in Agriculture (Irrigation), Technikon Pretoria (Now Tshwane University of Technology), 1982.
- Certificate in Stereoscopic Interpretation, Geology and Resource Classification and Utilisation, Department of Agriculture, 1979.
- National Diploma in Agriculture, Technikon Pretoria (Now Tshwane University of Technology), 1976.

## OTHER EDUCATION:

- Certificate in Turf Grass Management, Technikon Pretoria, 1987
- Certificate in Landscape Management, Technikon Pretoria, 1988
- Cultivated pastures (Mod 320), University of Pretoria, 1995
- NOSA Health and Safety Certificate, 1996
- FSC Auditors Course (Woodmark, UK) Sappi Ltd, 2003
- Certificate of Competence: Civil Designer - Design Centre and Survey and Design (Knowledge Base, August 2005)

## SUMMARY

Work experience of 49 years were progressively gained whilst working as a land use planner (1971-1979 - Extension technician); Lecturer in agricultural engineering and conservation subjects (1980- 1997) and Agricultural Consultant (1998 onwards). Always striving to find the equilibrium in using the natural resources for agricultural production.

## CHRONOLOGICAL EMPLOYMENT

| | |
|---|---|
| **Period** | 1971-1980 |
| **Company** | Department of Agriculture Transvaal region |
| **Position occupied** | Final: Senior Extension Technician |
| **Farm planning, technical support, general agricultural extension.** | |
| • Resource potential analyses, Soil classification, Veld evaluation.<br>• Conservation practices on arable land: Include water runoff planning, surveying and design of conservation works. Demonstration of building and inspection of completed structures.<br>• Conservation practices on non-arable land. Veld classification evaluation and management planning.<br>• Survey and design of stock watering systems. Inspection of completed system.<br>• Participated in the development of target areas which included soil survey and water run off planning<br>• Assistance with experimental conservation and agronomy trials. | |

| | |
|---|---|
| **Period** | 1980-1996 |
| **Company** | Technicon Pretoria |
| **Position occupied** | Lecturer |
| Lecture subjects required to obtain a National Diploma in Agriculture. | |
| **Subjects lectured**<br>Land use planning<br>Soil conservation techniques<br>Agricultural mechanisation<br>Pasture science 1 A<br>Drainage | |

| | |
|---|---|
| **Period** | January 1997 – May 2004 |
| **Company** | Self employed |
| **Position occupied** | Agricultural Consultant (Land use planner) |
| **Soil and veld survey for land capability classification**. | |
| • Physical audit and stock taking of Irrigation Scheme infrastructure at Loskop Dam, Hartebeespoort Dam, Buffelspoort Dam, Bospoort Dam, Roodekopjes Dam and Vaalkop Dam.<br>• Potential assessments and land use plans for four new upcoming farmers in the Limpopo Province.<br>• Undertook reconnaissance soil surveys on various plantations and farms.<br>• GPS survey and alien identification for mapping of Jukskei and Swartspruit areas, as part of the Working for Water Program.<br>• Participated in a due diligence audit on various plantations in the Limpopo and Mpumalanga Provinces as part of the preparation for a British company's tender to purchase these plantations.<br>• Survey to provide a detailed inventory of the forest resources in 17 specified Forest Reserves in Ghana to develop a practical and operationally sound methodology for monitoring the natural forest resources in Ghana, based on satellite imagery for the Ghana Forestry Commission.<br>• Lectures Basic Farm Planning short courses in Limpopo and Gauteng. | |

| | |
|---|---|
| **Period** | June 2004 – June 2006 |
| **Company** | Gauteng Department of Agriculture Conservation and Environment |
| **Position occupied** | Acting Assistant Director Resource planning and Utilization |
| **Site classification, evaluation, land use planning and farming extension in general.** | |
| • Plan the utilization of agricultural resources in the Province for sustainable agricultural production and economic development<br>• Provide advanced scientific and practical information, advice and training (formal and informal) pertaining to land use planning to stakeholders, in order to maximise their ability to utilise their farm land effectively.<br>• Irrigation design and technical support.<br>• Evaluate Scoping Reports for development and exemption for EIA application.<br>• Capability surveys for Land Reform for Agricultural Development Land<br>• Member of technical working group for the zonation of high potential land in Gauteng | |

| | |
|---|---|
| **Period** | July 2006 to date |
| **Company** | Self employed |
| **Position occupied** | Land Use Consultant |
| **Period of employment** | 14 years |
| **Compile agricultural potential studies** | |
| Land capability classification and evaluation as part of<br>• Environmental Impact Assessments<br>• Motivation report for change in land use<br>• Verification of desktop studies.<br>• Specialised agricultural ventures. | |
| Agricultural impact studies for Scoping and EIA relating to :<br>• Construction of renewable energy facilities (Various solar as well as wind and hydro electrical)<br>• Rezoning municipal boundary (Witsand)<br>• Construction packaging facility (Augrabies)<br>• Construction desalination plant (Witsand)<br>• Establish new graveyard (Zoar)<br>• Feasibility study feedlot (Sudan)<br>• Mapping potential agricultural land (Kongo)<br>• Verifying desktop studies | |

**Appendix B**

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

## DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

| | (For official use only) |
|---|---|
| File Reference Number: | 12/12/20/ or 12/9/11/L |
| NEAS Reference Number: | DEA/EIA |
| Date Received: | |

Application for integrated environmental authorisation and waste management licence in terms of the-

(1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and

(2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

## PROJECT TITLE

| | | | |
|---|---|---|---|
| Specialist: | C R Lubbe | | |
| Contact person: | Christo Lubbe | | |
| Postal address: | 4 Protea Street, Riversdale | | |
| Postal code: | 6670 | Cell: | 082 853 1274 |
| Telephone: | -- | Fax: | -- |
| E-mail: | macquarrie@vodamail.co.za | | |
| Professional affiliation(s) (if any) | None | | |

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|---|---|---|---|
| Project Consultant: | Cape Environmental Assessment Practitioners (Pty) Ltd | | |
| Contact person: | Dale Holder | | |
| Postal address: | PO Box 2070, George | | |
| Postal code: | 6530 | Cell: | 082448 9225 |
| Telephone: | 044 874 0365 | Fax: | 044 874 0432 |
| E-mail: | dale@cape-eaprac.co.za | | |

4.2 The specialist appointed in terms of the Regulations_

I, Christiaan Rudolf Lubbe, declare that –

General declaration:

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

Signature of the specialist:

C R Lubbe

Name of company (if applicable):

18 June 2020

Date: