

**SUBSOLAR ENERGY PTY (Ltd) SITE ASSESSMENT OF  
HARTSBOOM 734 RE, NORTH WEST PROVINCE, SOUTH  
AFRICA**

NOVEMBER 2015



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## 1. Executive Summary

The remaining extent of the farm Hartsboom 734, located near Vryburg is owned by Nicolaus Johannes Jacobus van Rooyen. The farm is approximately 2035.98 hectares (ha), within the North West Province, Registration Division HN, South Africa (Figure 1). The study area falls within the Dr Ruth Segomotsi Mompati District Municipality, located in the Naledi Local Municipality.

The landscape consists of level plains with some relief and plains and rolling or irregular plains with low hills or ridges. The farm is situated next to the N18. For connection to the grid, the site is situated next to a power line and the site is close to the Mookodi substation. The site has moderate agricultural potential as well as low potential grazing capacity. From a hydrological perspective, there was one river identified on the site. This site has favourable conditions for a solar power plant due to its environmental conditions, weather conditions (i.e. Vryburg has solar radiation levels of 1780 kwh/kwp) as well as site access.

The site is larger than 2000 ha; has good solar radiation, ecology and relative flat terrain (refer to Figures below). Given its moderate agricultural potential and moderate potential grazing capacity, possible problems may arise with environmental authorisation. Three EIA's have been conducted within 5km of the site.

Some parts of this site may not be suitable due to issues found on it namely structures, rivers and ridges, etc.

## 2. The farm Hartsboom 734 RE

The farm Hartsboom 734 RE is located within the North West Province, Registration Division HN, South Africa and falls within the Dr Ruth Segomotsi Mompati District Municipality, located in the Naledi Local Municipality.

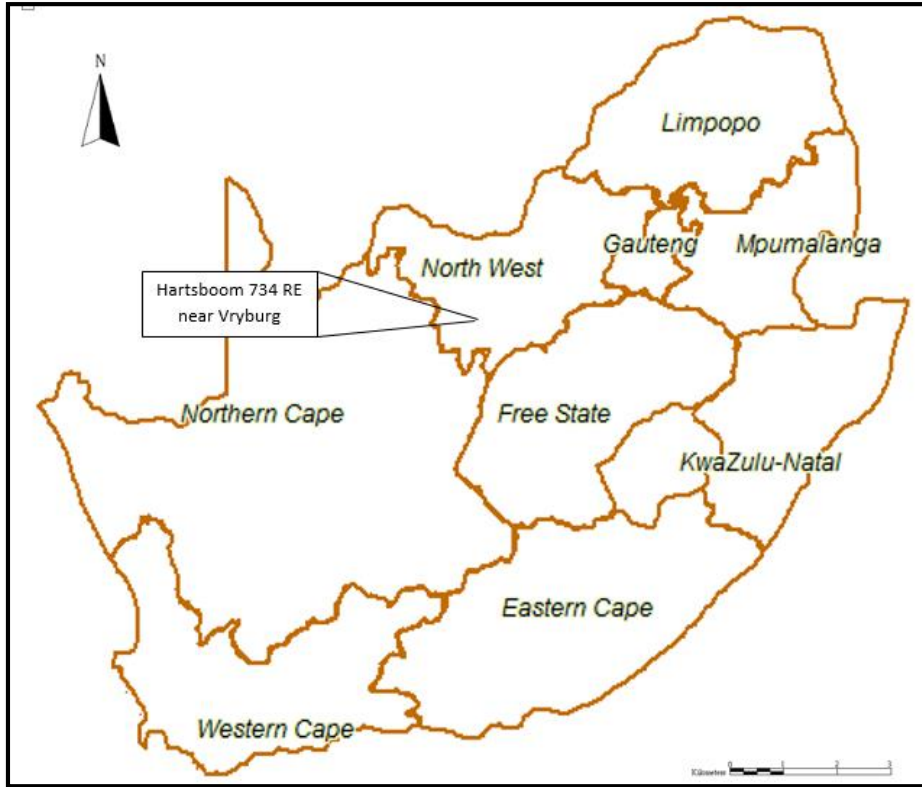


Figure 1: Location of the site

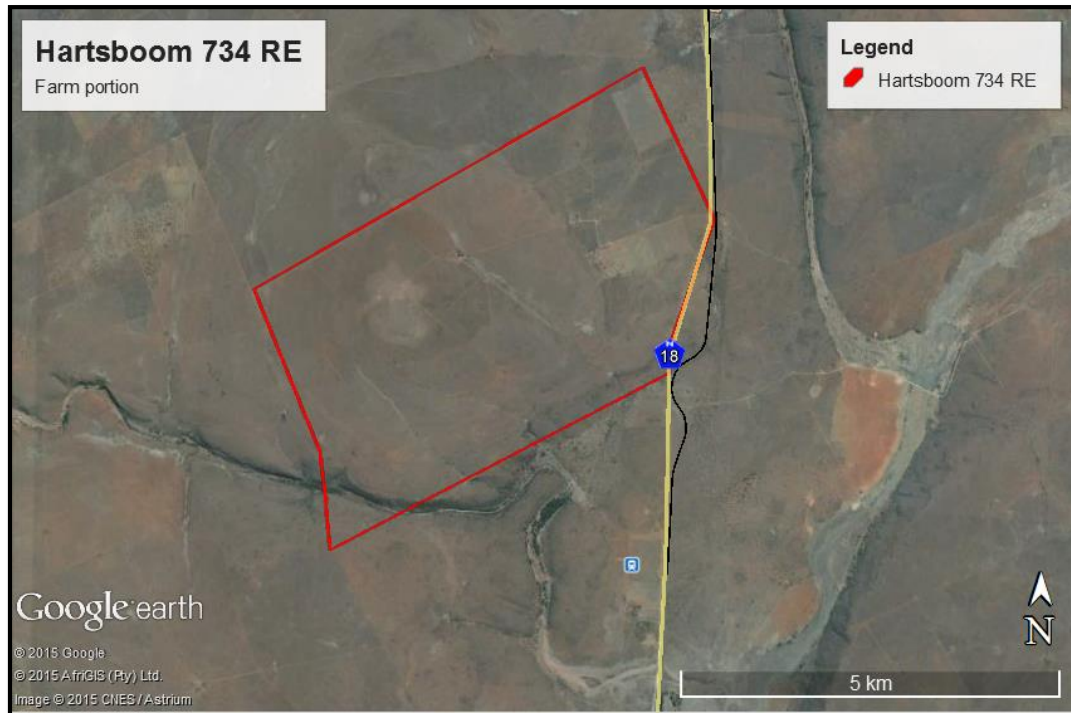


Figure 2: Land Portion of farm

### 3. Power lines and Substations

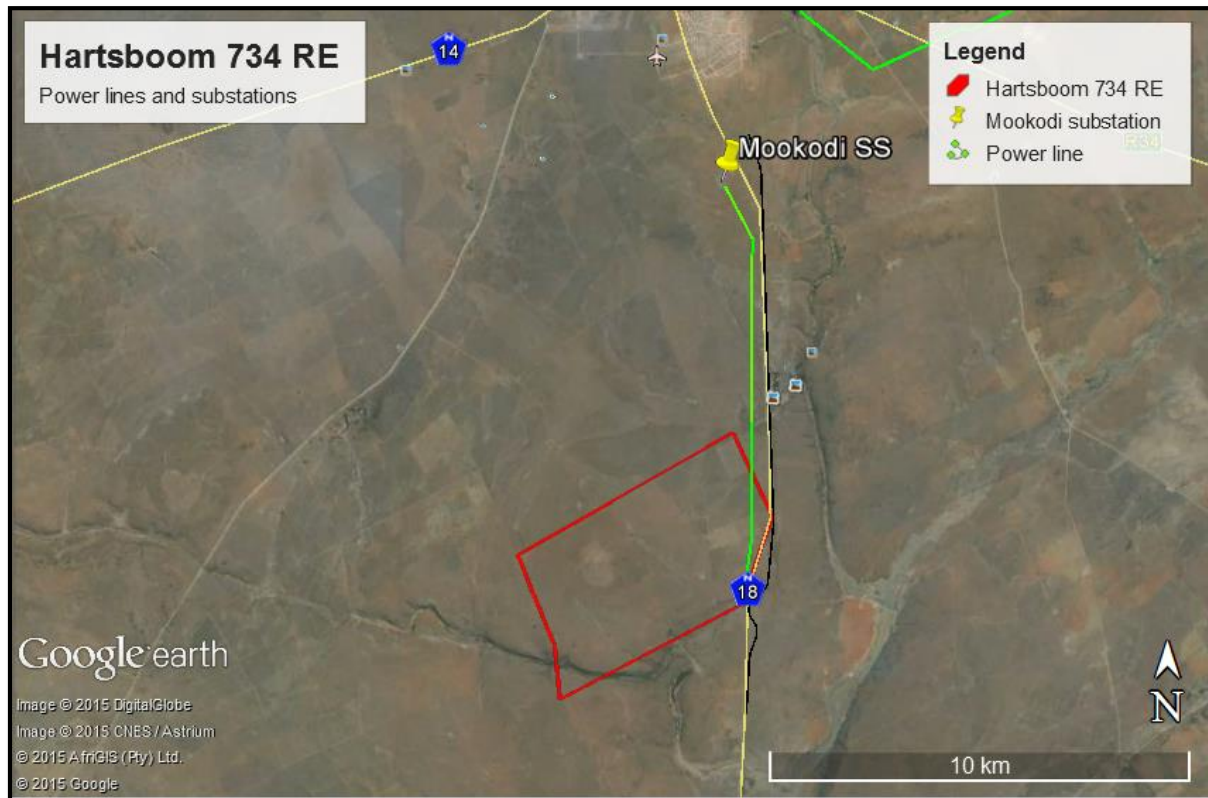


Figure 3: Power lines and substations

#### 3.1. Substations near sites

DESCRIPTIO: MOOKODI SUBSTATION

VOLTAGE: 132.0 [kV]

#### 3.2. Power Lines near site

DESCRIPTION: POWER

LINE FROM MOOKODI

VOLTAGE: 132.0 [kV]

#### 4. Farm portions and size

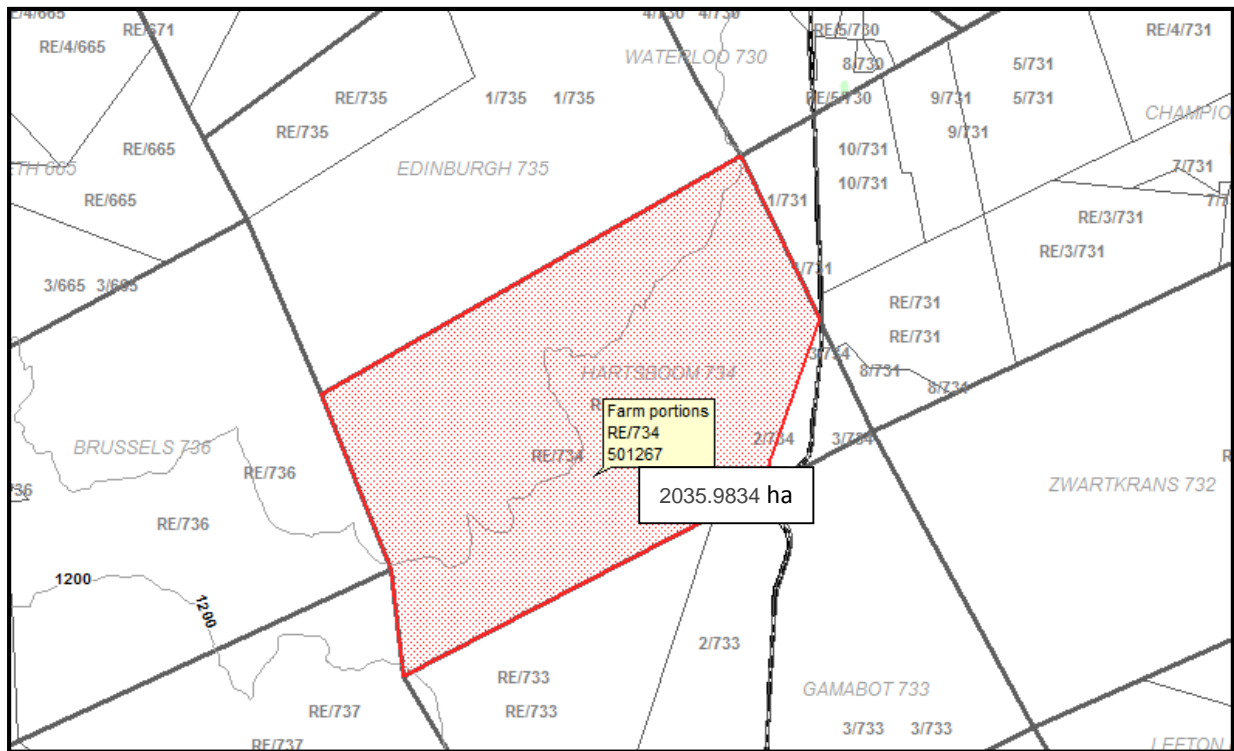


Figure 4: Farm portion (Planet GIS) Farm Portion and size

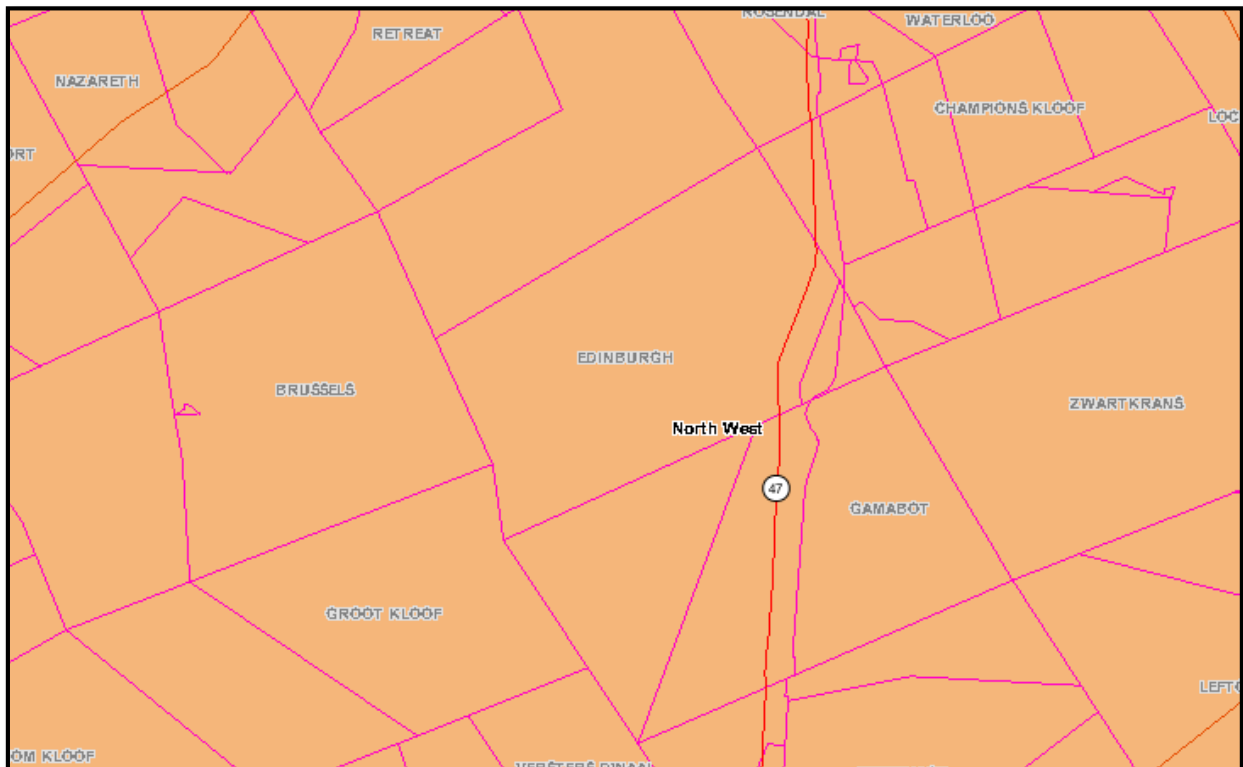


Figure 5: Land Portions (Agis)



## 5. Environmental impact assessments done in the area:

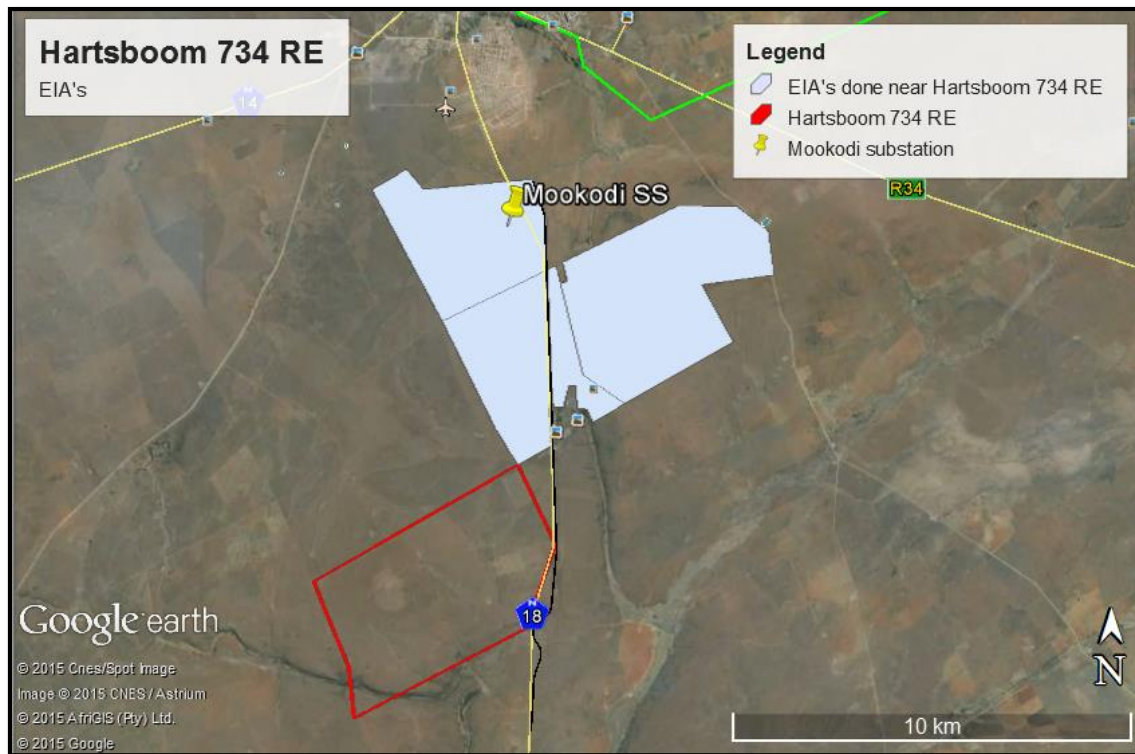


Figure 6: EIA's done in the area

### Proposed Tiger Kloof Solar Photovoltaic energy facility:

14/12/16/3/3/2/535	
PRJ_REF	14/12/16/3/3/2/535
ARCHIVE	Active
PROVINCE	North West
LOCAL_MUNI	Naledi Local Municipality
DISTRICT_M	Dr Ruth Segomotsi Mompati
TOWN	Naledi Rural
AMEND_COMM	
APP_DATE	2013/08/01
EA_DATE	
PRJ_TITTLE	Proposed Tiger Kloof Solar Photovoltaic energy facility near Vryburg, North West Province
EA HOLDER	Kabi Solar Pty Ltd
MEGA_WATT	75
TECHNOLOGY	Solar PV
PRJ_STATUS	IN PROCESS
EA_PROCESS	Scoping and EIA
VERIFIED	YES

**Sediba Solar Power Plant:**

14/12/16/3/3/2/390	
PRJ_REF	14/12/16/3/3/2/390
ARCHIVE	Active
PROVINCE	North West
LOCAL_MUNI	Naledi Local Municipality
DISTRICT_M	Dr Ruth Segomotsi Mompati
TOWN	Naledi Rural
AMEND_COMM	
APP_DATE	2012/07/16
EA_DATE	2013/05/31
PRJ_TITLE	Construction of the 75MW Photovoltaic facility and associate infrastructure in Naledi
EA HOLDER	Sediba Solar Power Plant Pty Ltd
MEGA_WATT	75
TECHNOLOGY	Solar PV
PRJ_STATUS	APPROVED
EA_PROCESS	Scoping and EIA
VERIFIED	YES

**DPS79 Solar Energy Pty Ltd:**

14/12/16/3/3/2/308	
PRJ_REF	14/12/16/3/3/2/308
ARCHIVE	Active
PROVINCE	North West
LOCAL_MUNI	Naledi Local Municipality
DISTRICT_M	Dr Ruth Segomotsi Mompati
TOWN	Naledi Rural
AMEND_COMM	Amend: contact details and associated infrastructure
APP_DATE	2013/04/05
EA_DATE	2013/05/26
PRJ_TITLE	The Proposed Construction Of The 75mw Photovoltaic Solar Plant And Associated Infrastructure On A Portion Of The Farm Waterloo 992 In, Naledi Local Municipality Of The North West Province
EA HOLDER	DPS79 Solar Energy Pty Ltd
MEGA_WATT	75
TECHNOLOGY	Solar PV
PRJ_STATUS	APPROVED
EA_PROCESS	Scoping and EIA
VERIFIED	YES



## 6. Natural Resources

### 6.1. Geology

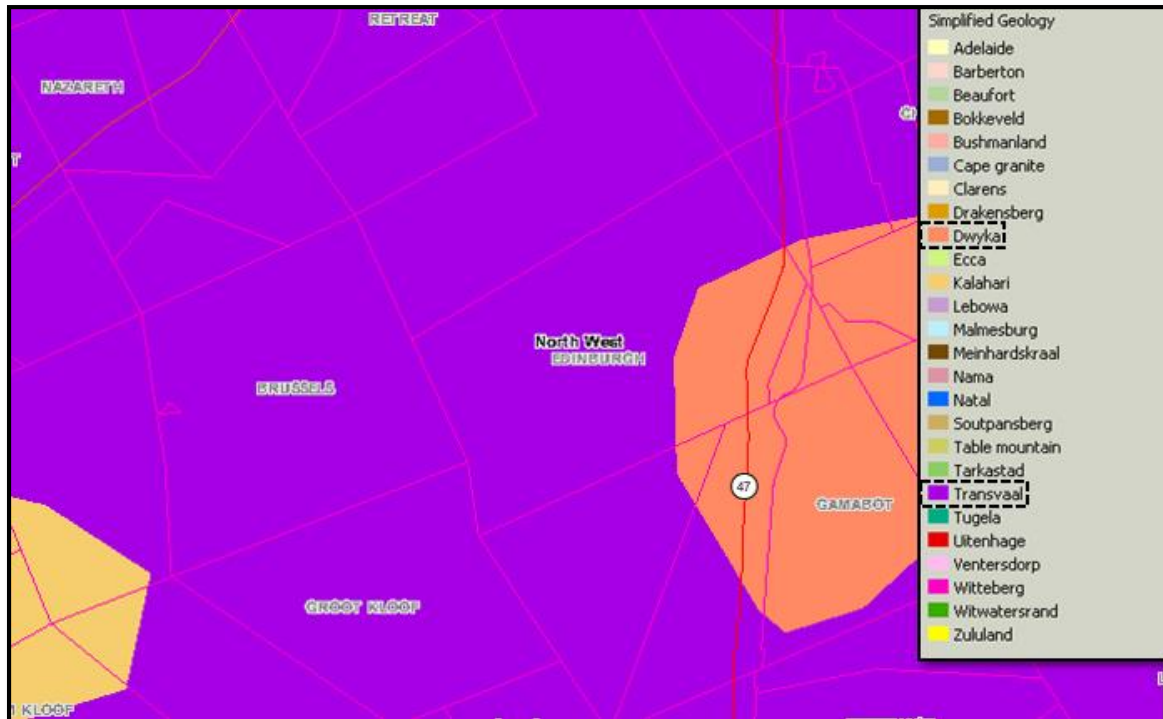


Figure 7: Simplified Geology (Agis)

### 6.2. Terrain

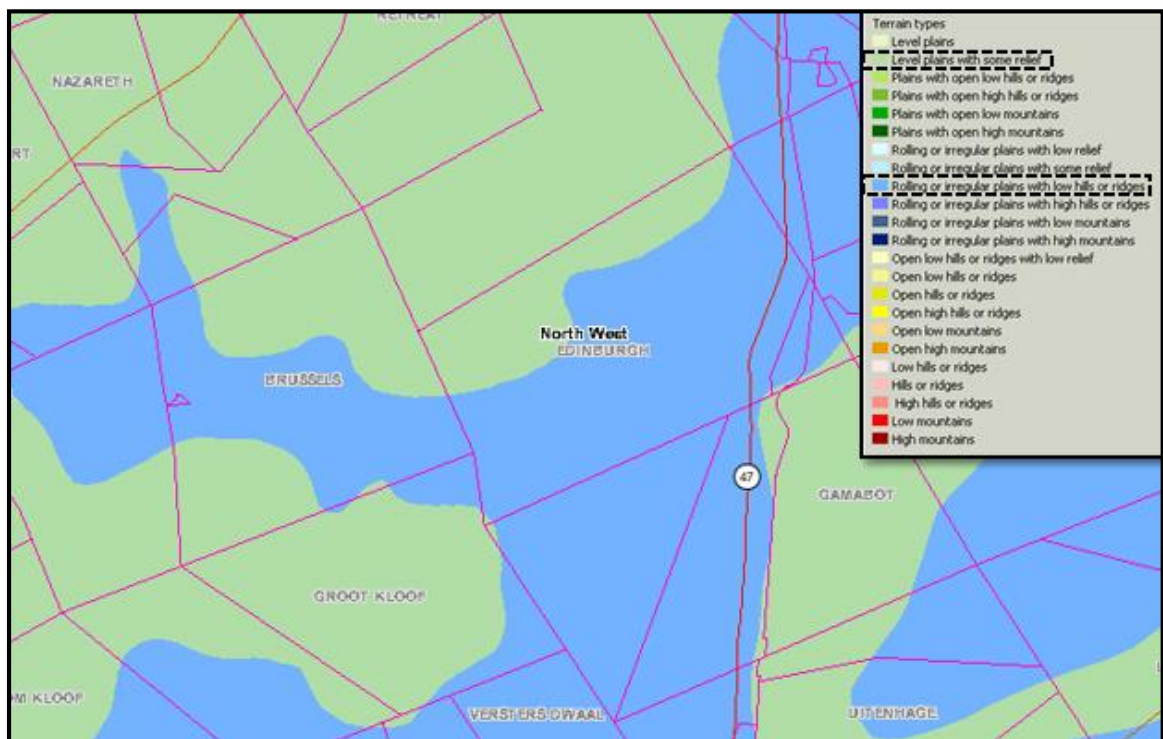


Figure 8: Terrain type (Agis)

### 6.3. Vegetation:



Figure 9: Vegetation biome (Agis)

### 6.4. Water

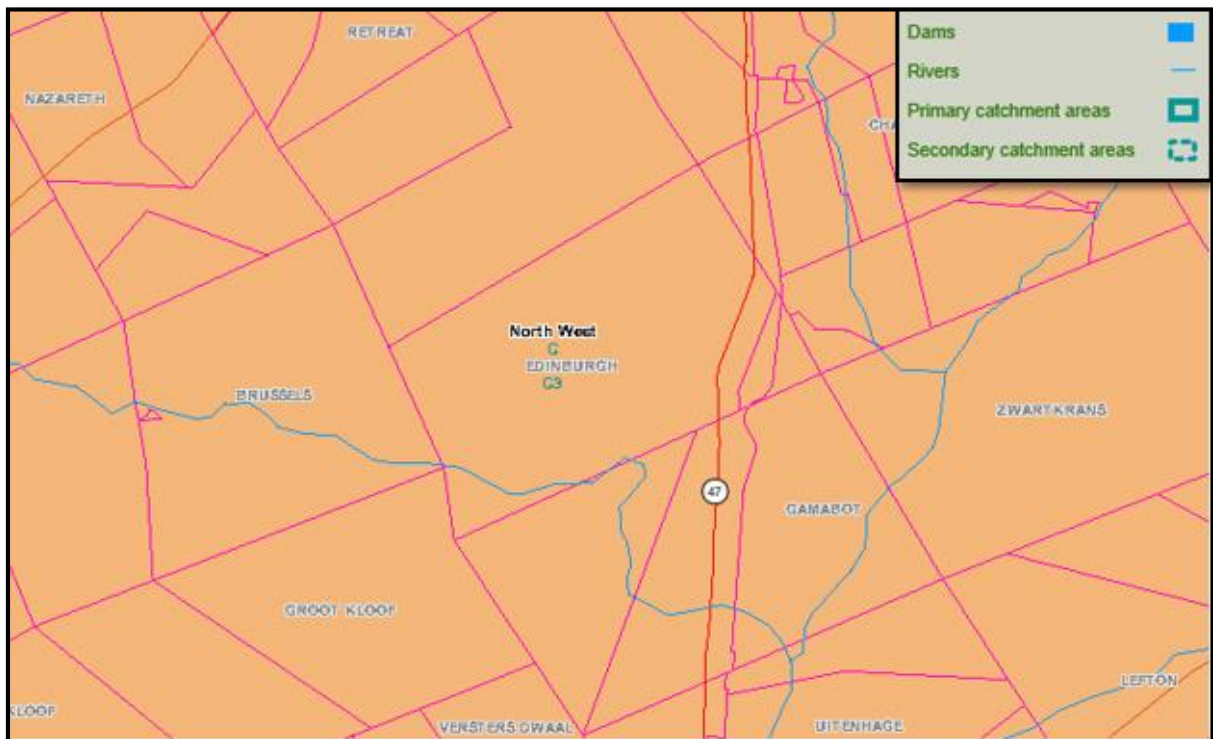


Figure 10: Dams and rivers (Agis)

## 7. Agricultural Potential

### 7.1. Land capability

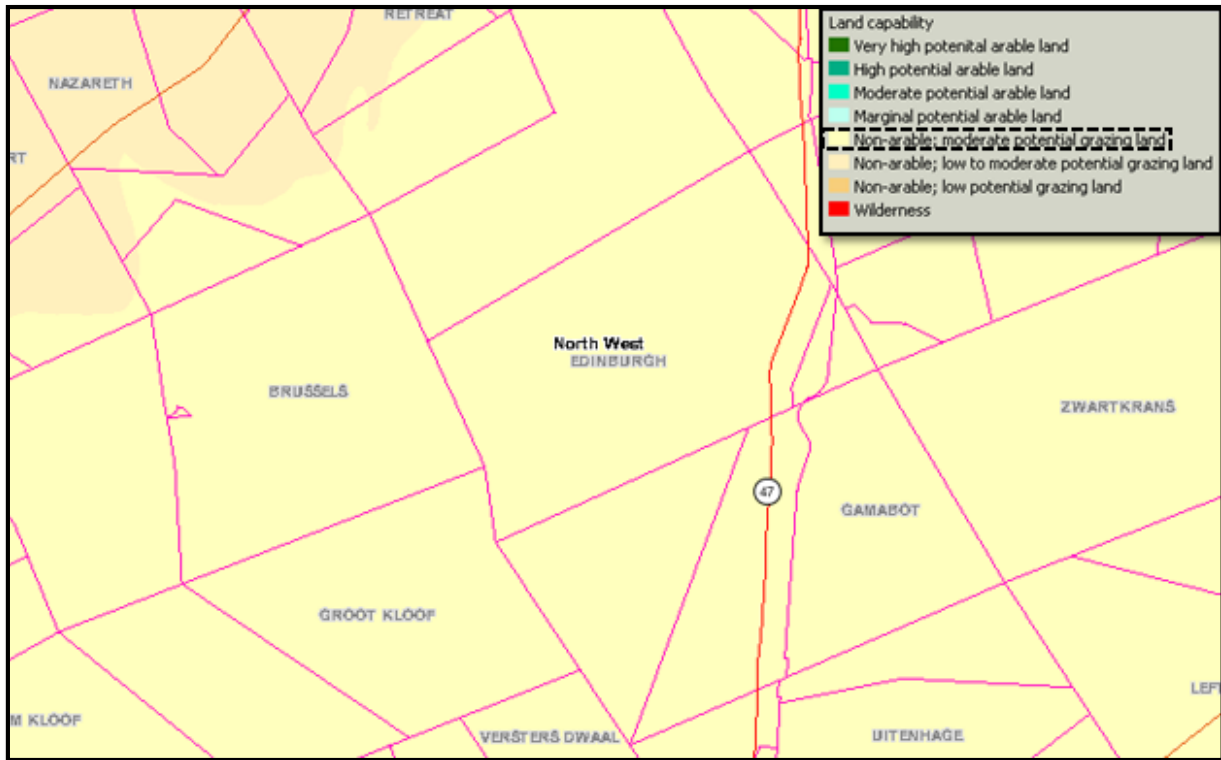


Figure 11: Land Capability (Agis)

### 7.2. Livestock

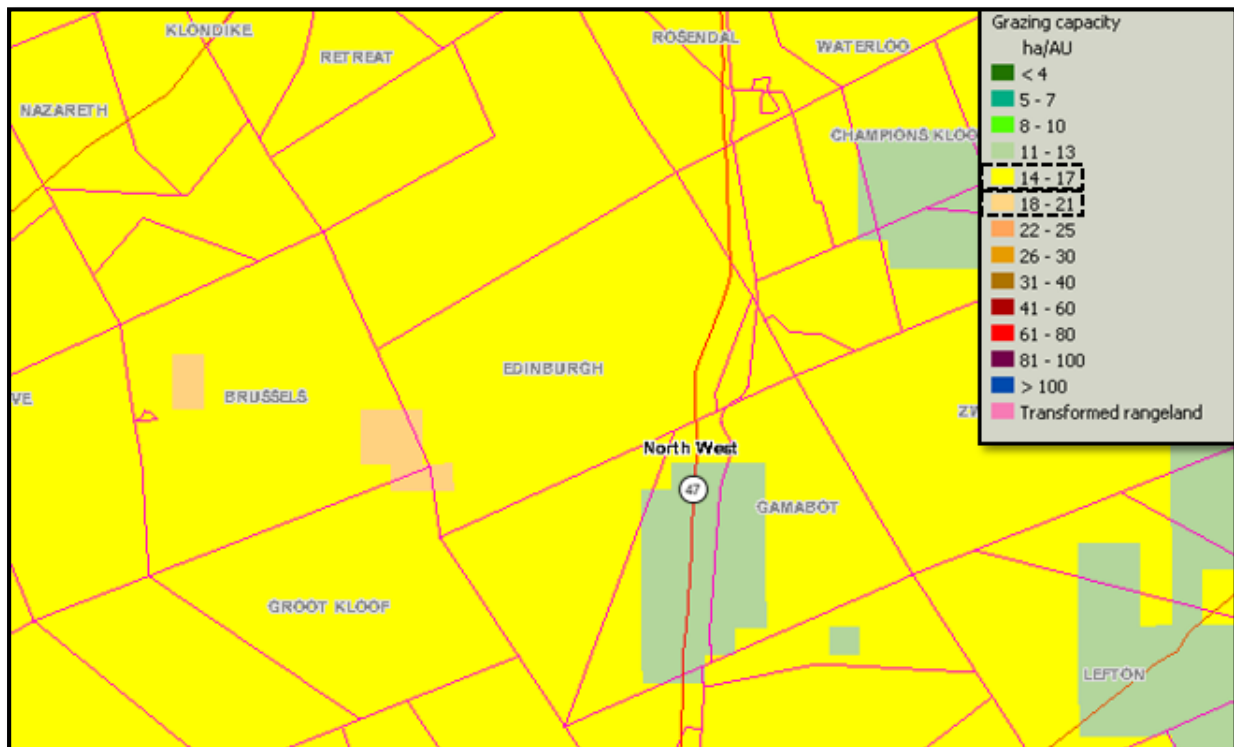


Figure 12: Grazing Capacity (Agis)



## 8. Land cover and Land use

### 8.1. Land use

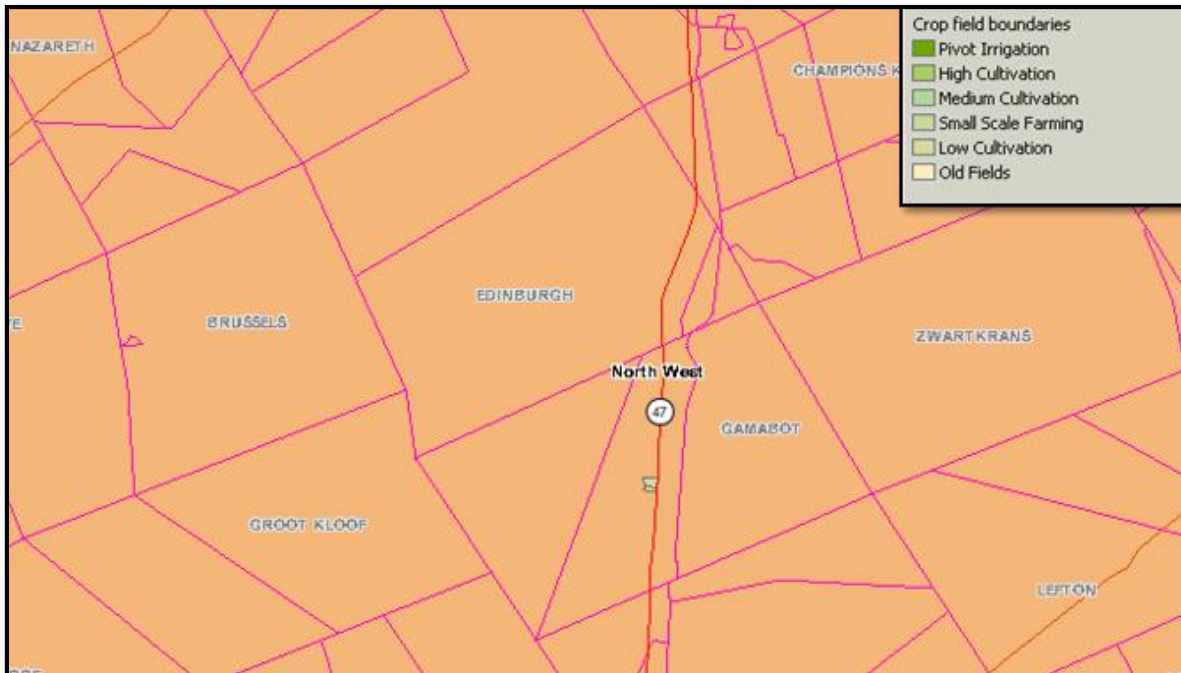


Figure 13: Crop field boundaries

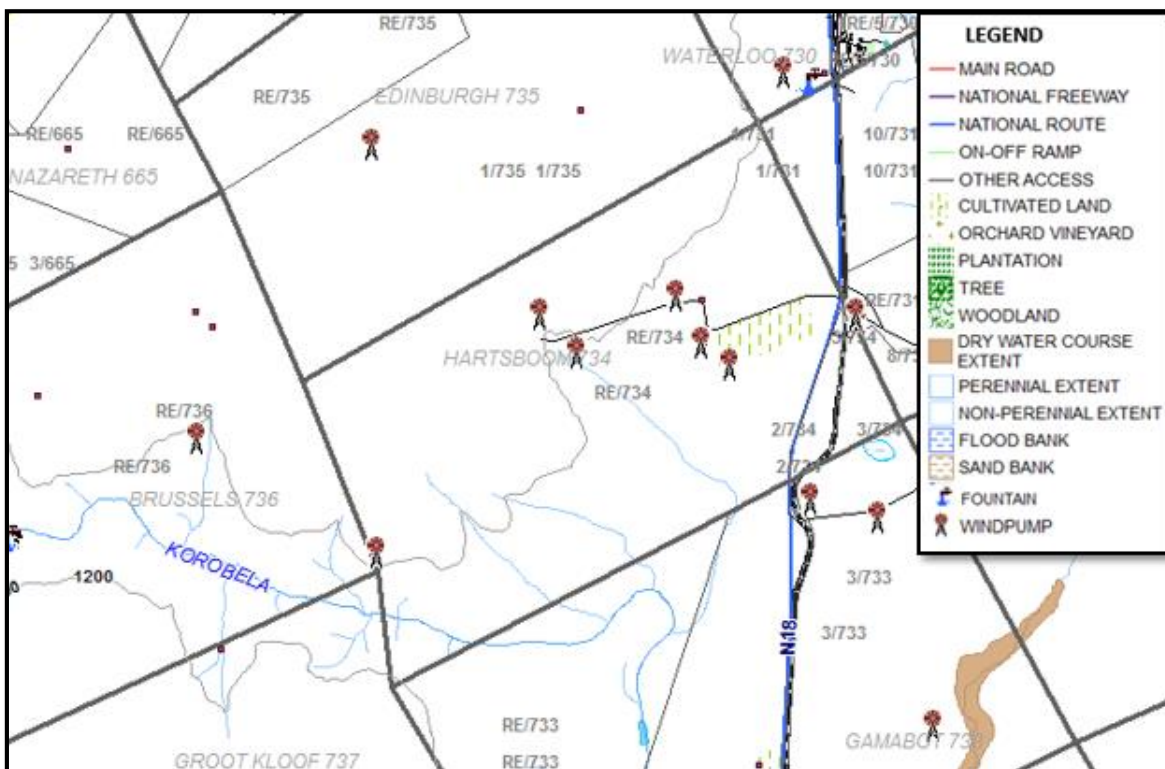
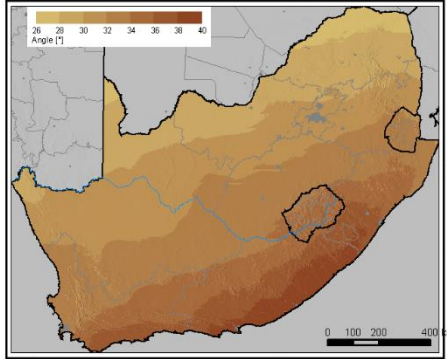


Figure 14: Vegetation and structures (PlanetGIS)

## 9. Solar Resource

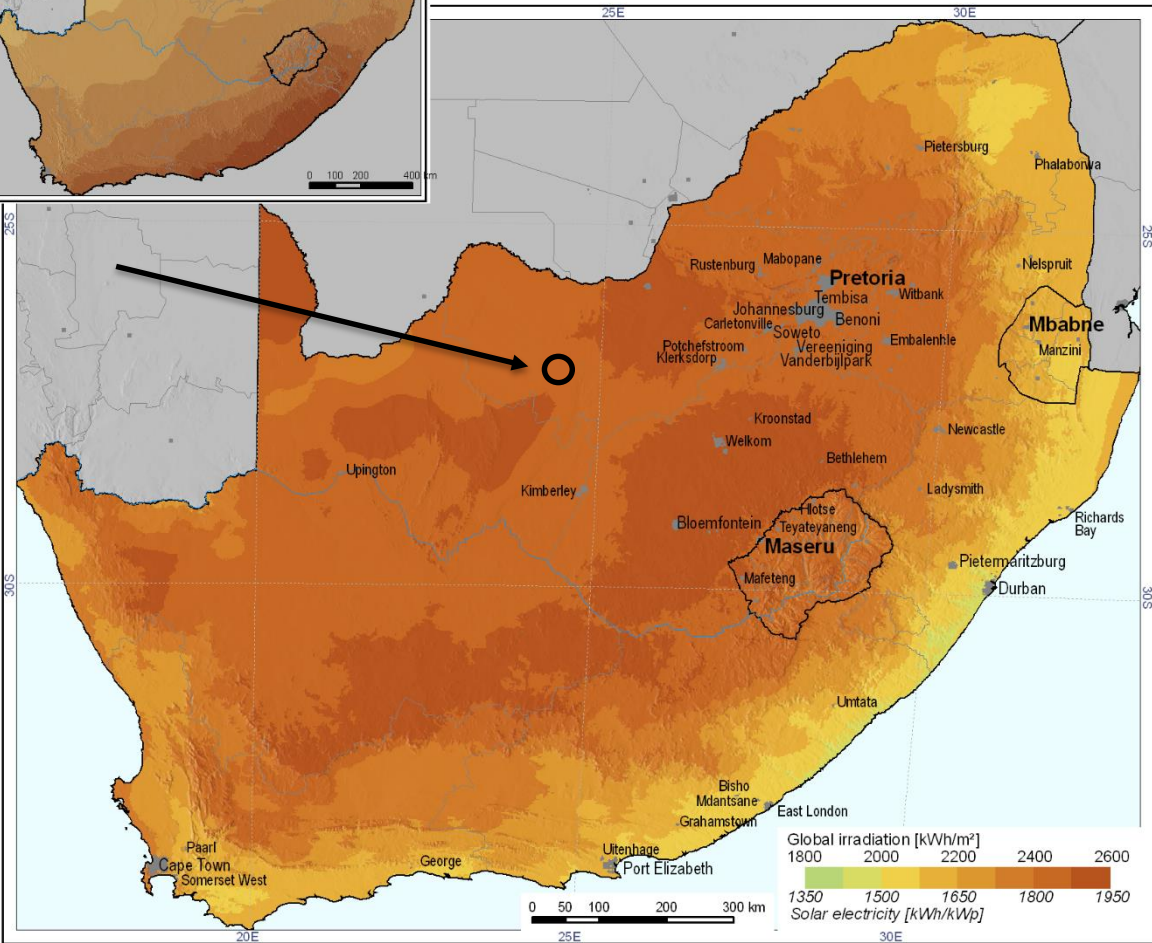
The  $E_m$  is 1780 yearly with an inclination of 30 degrees, and -177 degrees orientation. Estimated losses due to temperature and low irradiance: 12.4%.

Optimum inclination of PV modules to maximize yearly energy yield



## South Africa

Yearly sum of global irradiation incident on optimally-inclined surface  
Yearly sum of solar electricity generated by 1 kWp system with optimally-inclined modules and performance ratio 0.75



PVGIS © European Communities, 2001-2006  
HelioClim-1 © Ecole des Mines de Paris/ARMINES, 2001-2006

<http://re.jrc.ec.europa.eu/pvgis/pv/>  
<http://www.helioclim.org/>

Figure 15: Global irradiation

## 10. Possible areas for development

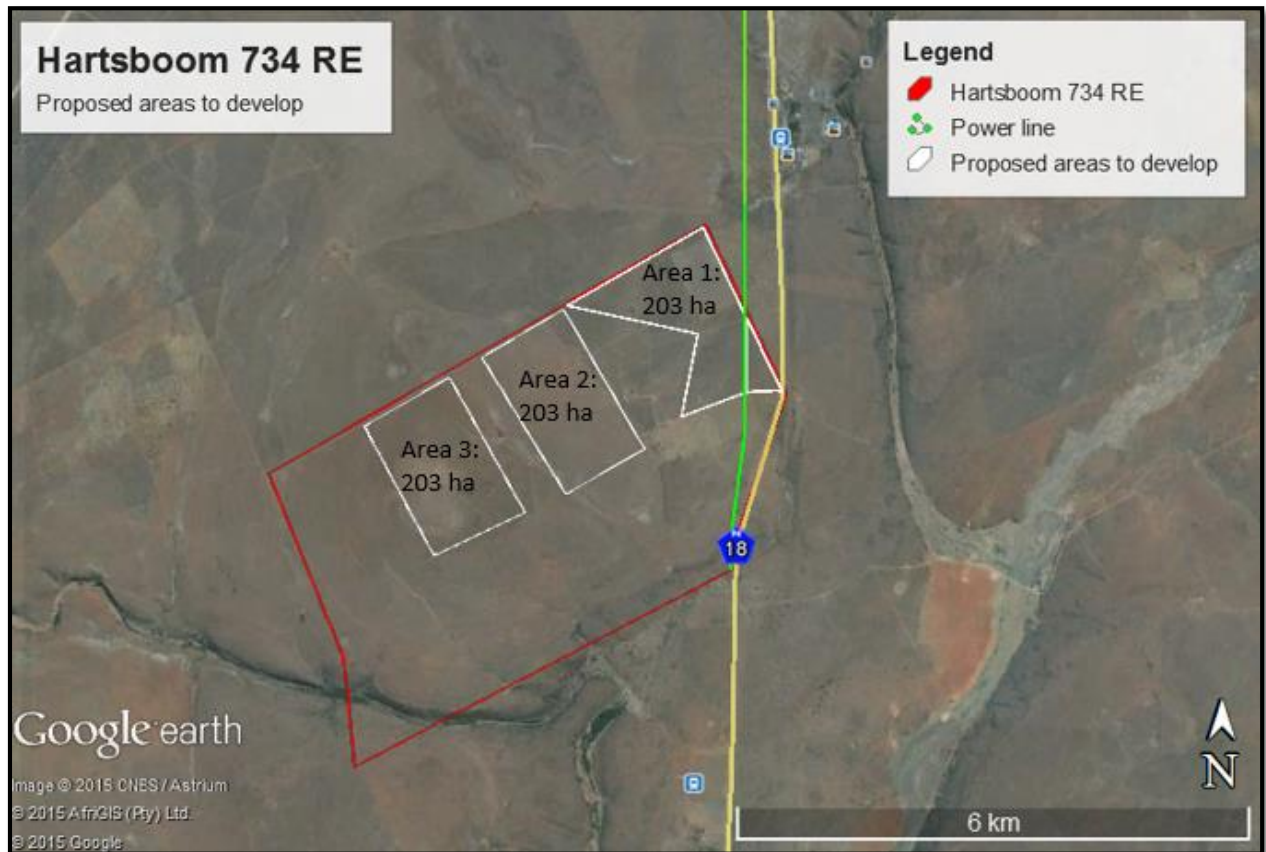


Figure 16: Proposed development area for a solar power plant

Keeping all the above information into consideration, 3 possible areas was identified for a proposed solar plant. These areas were identified due to the low impact on the environment and infrastructure of the land portions and mine. Although, these areas are big enough for a solar power plant, only a small area within these identified areas will be utilize for a solar power plant and will be determined by the best suitable are and size of the plant.