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**AGRICULTURAL IMPACT ASSESSMENT
FOR PROPOSED KISON SOLAR ENERGY FACILITY, LIMPOPO PROVINCE
SCOPING PHASE REPORT**

**Report by
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August 2013

1. INTRODUCTION

Networx Renewables (Pty) Ltd is proposing to develop the Kison Solar Energy Facility 15 kilometres south west of Polokwane in the Limpopo Province (see Figure 1). The facility will have a total generating capacity of up to 75 MW. The development will consist of arrays of photovoltaic panels supported by mounting structures, an inverter station, internal access roads, cabling, fencing, an on-site substation with connection to the Eskom transmission lines on the site boundary, and a building for a workshop, storage, and offices.

The development is currently in the Scoping Phase of the Environmental Impact Assessment and this scoping report describes the soils and agricultural potential of the proposed site and the impacts that the development may have on agricultural resources and production. Johann Lanz was appointed by Savannah Environmental as an independent specialist to conduct the study on soils and agricultural potential as part of the EIA.

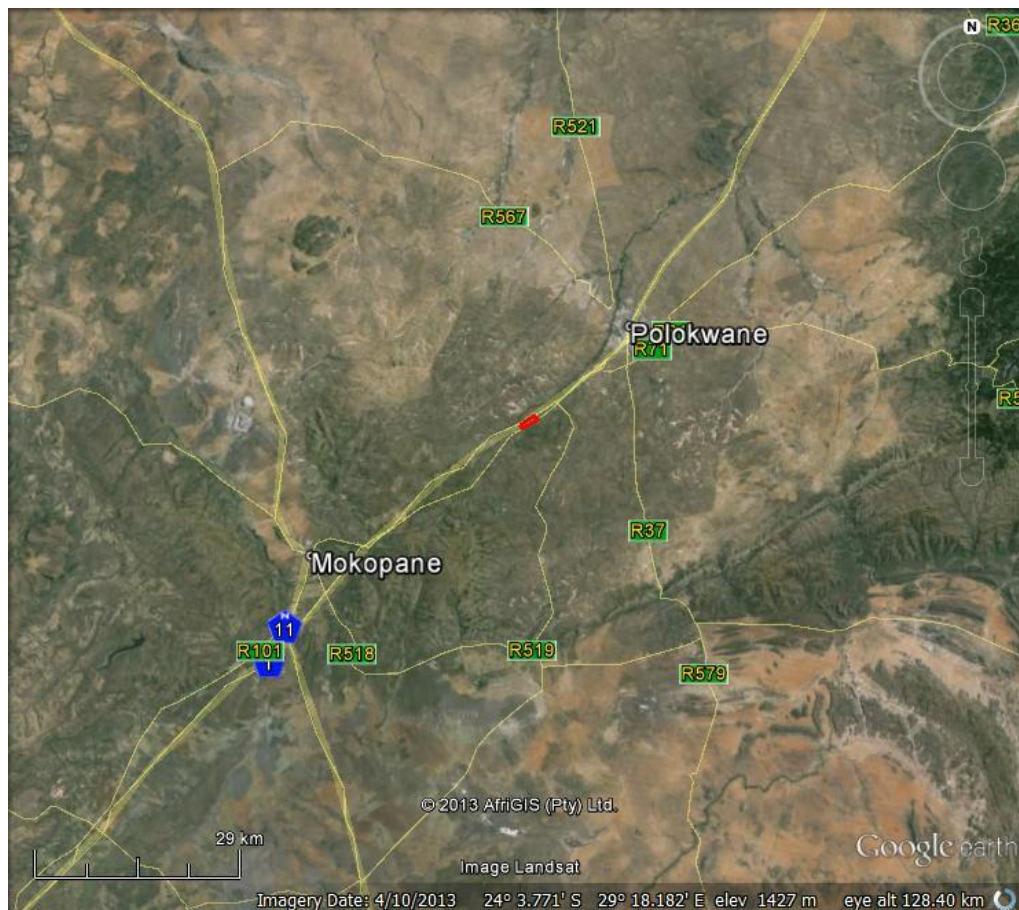


Figure 1. Location map of the proposed site (with red boundary) along the N1 south west of Polokwane.

2. DESCRIPTION OF THE SOILS AND AGRICULTURAL CAPABILITY OF THE

AFFECTED ENVIRONMENT

All the information on soils and agricultural potential in this report has been obtained from the AGIS online database, produced by the Institute of Soil, Climate and Water (Agricultural Research Council, undated).

The proposed site has a gentle slope of approximately 3% at a north westerly aspect across the site. The site is 125 hectares but the actual development footprint will be smaller than that. The Acocks veld type classification for the entire site is False grassveld. The geology of the site is Archaean granite gneiss and rocks of the Barbeton Supergroup.

Rainfall for the site is given as 515 mm per annum according to the South African Rain Atlas (Water Research Commission, undated). The average monthly distribution of rainfall is shown in Table 1. In terms of rainfall and evaporation the site is classified as semi-arid, which is a limitation to agriculture.

Table 1. Average monthly rainfall for the site (24° 01' S 29° 19' E) in mm (Water Research Commission, undated)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot
95	78	65	35	14	5	3	4	13	39	72	93	515

The land type classification is a nation-wide survey that groups areas of similar soil and terrain conditions into different land types. There is only a single land type across the site, namely Ae225. A summary detailing soil data for this land types is provided in Table 2. This land type comprises predominantly well-drained, deep to moderately deep, red unstructured soils with a fairly high clay content.

Table 2. Land type data for site. Erosion indicates the severity of the water erosion hazard on an 8 class system, with 8 being most severe.

Land type	Land capability class	Dominant soil forms	Depth (cm)	Clay % A horizon	Clay % B horizon	Depth limiting layer	Erosion hazard class	% of land type
Ae225	3	Hutton	60-120	25-40	35-50	R, so	2	45
		Hutton	40-120	15-30	15-35	R, so		40
		Oakleaf	90-120	15-30	15-35	R, so		5
		Shortlands	60-120	35-45	40-55	so		5
		Valsrivier	80-120	25-40	35-50	vp		5

Land capability class 3 = moderate potential arable land. Depth limiting layers: R = hard rock; so = partially weathered rock; vp = dense clay layer.

This land type has a low to moderate susceptibility to water erosion, and is classified as class 2 erosion hazard (on 8 class scale). Class 2 is gently to moderately sloping land and soils that have low to moderate erodibility.

Land capability is the combination of soil suitability and climate factors. The entire site has a land capability classification, on the 8 category scale, of Class 3 – moderate potential arable land.

Parts of the site have been cleared of bush for cultivation in the past, but none of the site appears to have been cultivated in the last 10 years and bush has re-established across it. There has been quarrying on the site in places. Currently the site appears only to be used for grazing. There is no evidence of irrigation on the site.

As an indication of agricultural potential, the potential maize yield is classified as between 1.5 and 2.4 tons per hectare. The natural grazing capacity is classified as between 5 and 10 hectares per large stock unit.

From an agricultural impact point of view, no sensitive areas were identified during scoping that should be avoided for inclusion in the development. Agricultural potential is fairly uniform across the site and there are therefore no preferred locations for the development within the site.



Figure 2. The proposed site within red boundary.

3. POTENTIAL IMPACTS

The following have been identified as potential impacts on agricultural resources and productivity, the significance of which will be determined during the EIA Phase. All these impacts are local in extent, confined to the site.

1. Loss of agricultural land use due to direct occupation by PV panels and other infrastructure, including roads, for the duration of the project (all phases). This will take affected portions of land out of agricultural production.
2. Soil erosion due to alteration of the land surface run-off characteristics. Alteration of run-off characteristics may be caused by construction related land surface disturbance, vegetation removal, the establishment of hard standing areas and roads, and the presence of panel surfaces. Erosion will cause loss and deterioration of soil resources and may occur during all phases of the project.
3. Loss of topsoil due to poor topsoil management (burial, erosion, etc) during construction related soil profile disturbance (levelling, excavations, road surfacing etc.) and resultant decrease in that soil's agricultural suitability.
4. Generation of alternative land use income.
5. Cumulative impacts due to the regional loss of agricultural resources and production as a result of other developments on agricultural land in the region.

4. THE POTENTIAL SIGNIFICANCE OF IMPACTS

The significance of agricultural impacts is not likely to be high as the land is not highly productive agricultural land, and is only used for grazing.

5. ASSESSMENT TO BE UNDERTAKEN IN THE EIA PHASE

The following assessments will be undertaken in the EIA phase:

4.1 More detailed assessment of soil conditions

The EIA phase assessment will include a field investigation of soils and agricultural conditions across the site. This field investigation will be aimed at ground proofing the existing land type information and understanding the specific soil conditions on site. It will not be based on a grid spacing of test pits but will comprise a reconnaissance type of soil mapping exercise based on an assessment of surface conditions, topography, and hand augered samples in strategic places, if necessary. Such a soil investigation is considered adequate for the purposes of this study. A more detailed soil investigation is not considered likely to add anything significant to the assessment of agricultural soil suitability for the purposes of determining the impact of the development on agricultural

resources and productivity.

4.2 Assessment of erosion and erosion potential on site

The field investigation will involve a visual assessment of erosion and erosion potential on site, taking into account the proposed development layout.

4.3 Assessment of the impacts of specific construction activities and layout on soil conditions

The EIA phase will include an assessment of the specifics of construction activities and the proposed development layout on potential loss of topsoil.

4.4 Assessment of specific on-site agricultural activities

The EIA phase will gather more detail on agricultural activity on the site and identify any locally important soil and agricultural issues. This will be done through interviews with farmers and agricultural role players in the area.

4.5 Terms of reference for EIA study

The terms of reference for the EIA study will include the requirements for an agricultural study as described under point 4 of section C of the National Department of Agriculture, Forestry and Fisheries document: *Regulations for the evaluation and review of applications pertaining to renewable energy on agricultural land*, dated September 2011.

The above requirements together with requirements for an EIA specialist report may be summarised as:

- Identify and assess all potential impacts (direct, indirect and cumulative) and economic consequences of the proposed development on soils and agricultural potential.
- Describe and map soil types (soil forms) and characteristics (soil depth, soil colour, limiting factors, and clay content of the top and sub soil layers).
- Map soil survey points.
- Describe the topography of the site.
- Do basic climate analysis and identify suitable crops and their water requirements.
- Summarise available water sources for agriculture.
- Describe historical and current land use, agricultural infrastructure, as well as possible alternative land use options.
- Describe the erosion, vegetation and degradation status of the land.

- Determine and map, if there is variation, the agricultural potential across the site.
- Provide recommended mitigation measures, monitoring requirements, and rehabilitation guidelines for all identified impacts.

5. REFERENCES

Agricultural Research Council. Undated. AGIS Agricultural Geo-Referenced Information System available at <http://www.agis.agric.za/>.

Water Research Commission. Undated. South African Rain Atlas available at <http://134.76.173.220/rainfall/index.html>.