



AGRICULTURAL ASSESSMENT: COMPLIANCE STATEMENT

ESTABLISHING A PV SITE ON PORTION 1 OF ZWARTWITPENSBOKFONTEIN 434-KQ, KOEDOESKOP IN THE WATERBERG DISTRICT

Compiled for:

Conserva Environmental Management Services

Compiled by

Dr Andries Gouws Index

August 2023

DECLARATION

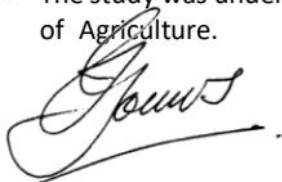
The observations, conclusions and recommendations made in this report are based on the best available data and on best scientific and professional knowledge of the directors of INDEX (Pty) Ltd. The report is based on GIS programming and utilises satellite tracking to map survey points. Survey points are normally accurate to within 3 metres; which must be considered in the use of the information.

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General declaration:

- INDEX acted as the independent specialist in this application;
- Performed 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;
- There were no circumstances that may compromise INDEX's objectivity in performing such work;
- INDEX have expertise in conducting the specialist report relevant to this application, including knowledge of NEMA and its regulations and any guidelines that have relevance to the proposed activity;
- Have no and will not engage in conflicting interests in the undertaking of the activity.
- The study was undertaken by Dr Andries Gouws. He is a registered member of SACNASP in the category of Agriculture.



August 2023

CONTENTS

1	SPECIALIST DECLARATION	6
2	BACKGROUND	8
3	TERMS OF REFERENCE.....	9
4	METHODS AND PROCEDURES	9
5	PROPOSED DEVELOPMENT	10
6	SITE EVALUATION.....	11
6.1	Present land uses	11
6.2	Climate	11
6.3	Soil properties	12
6.4	Vegetation	13
6.5	Water	14
6.6	Crop yield.....	14
6.7	Land capability	14
7	ECOLOGICAL SENSITIVITY – SCREENING TOOL	15
7.1	Screening tool	15
7.2	Findings of the Site sensitivity verification.....	16
8	IMPACT ASSESSMENT.....	18
8.1	Loss of high potential land	18
8.2	Loss of agricultural production	18
8.3	Loss of Agricultural infrastructure.....	18
8.4	Loss of soil due to erosion.....	18
9	CONCLUSIONS.....	19
10	RECOMMENDATION	20
11	ADDENDA.....	21
11.1	Sources of information	21
11.2	Gross margins.....	22
11.3	SACNASP certificate.....	24
11.4	Curriculum Vitae (CV).....	25
11.5	Observations	27

SUMMARY

The affected property is Portion 1 of Zwartwitpensbokfontein 434-KQ. It is located next to the D1234 Northam-Koedoeskop Road at Koedoeskop.

PROJECT DETAILS

- Project: 480 MW solar photovoltaic facility
- Applicant: Allied Green Energy (Pty) Ltd
- Site: Portion 1 of the farm Zwartwitpensbokfontein 434 KQ
- The property is approximately 375 hectares of which the Solar PV footprint area is 230ha.
- The solar facility will connect to the existing 132 KV Spitskop Mamba power line crossing property.

SITE ANALYSES

The land is undisturbed natural veld, which is used as animal grazing and browsing, mainly by wildlife.

The land in its natural state is Dwaalboom Thornveld of the Central Bushveld Biome. The western section of the farm is severely encroached by *Dichrostachys cinerea* (Sekelbos) that restricts access for livestock. There are many bare soil patches that indicate drought in the recent past and where grass has not yet recovered. The livestock carrying capacity for the PV site is less than 15 cattle.

There is no irrigation on the property. It is unlikely that a water use licence will be granted. There is also irrigable land closer to the river.

Land capability involves consideration of difficulties in land use owing to physical land characteristics, climate and the risks of land damage from erosion and other causes. The most limiting factor will decide the land use capability. In this instance it is determined by climate.

The farm is Class 7 or poorer, which is *low/moderate* sensitivity.

FINDINGS OF THE SCREENING TOOL

- There are no field crops on the site.
- The screening tool indicates the sensitivity of the site as high in general, and moderate on small portions in the east.

FINDINGS OF THE SITE SENSITIVITY VERIFICATION

- The evaluation agrees that there are no field crops on the site.
- The site evaluation found that the sensitivity is low; this is mainly as a result of the climate and the fact that there is no irrigation water available.

IMPACT OF THE DEVELOPMENT ON AGRICULTURE

- Loss of high potential agricultural land: No high potential and in terms of HUAL and CARA will be lost hence, mitigation is not applicable.
- Loss of grazing land: The land is not used for grazing but only by game animals for browsing. It is severely encroached by sekelbos and will require remedial action to gainfully utilise the vegetation as grazing. Mitigation can be achieved by removing the sekelbos. However, this is costly. Probably the most viable option is to establish the PV project and replant the site with pastures when the site is reclaimed.
- Loss of food security and farming income: there will be no loss of food production capacity due to the present state of the vegetation. Mitigation can be achieved by replanting the site with pastures at the project's end of life.
- There is no farming infrastructure on the portion to be developed.
- Fragmentation of farm land: no subdivision is proposed, the farming unit will remain unchanged.

- Land degradation: Intensive development can lead to soil degradation due to excessive use of chemicals, improper land management, and erosion. This negatively affects long-term agricultural productivity. The land portion is on even slopes where no industrial activities will take place. No impact is foreseen from polluting activities.

RECOMMENDATION

The PV site development takes place on low/medium potential land that has a low/medium sensitivity related to agriculture. The grading for site sensitivity was determined by the specialist following a detailed assessment of the site.

The site consists of moderately deep and shallow and rocky soils. The climate is not suitable for viable commercial crop production.

It is the author's opinion that there is no reason to prevent the project from being implemented.

Further, any measure or project that can help to relieve the country's electricity problems should be encouraged.

1 SPECIALIST DECLARATION

COMPLIANCE STATEMENT

Main findings of the study are as follows:

PV SITE

No cultivation takes place on the site.

According to the screening tool, the site has a high sensitivity for farming. A detailed assessment found that the climatic conditions and crop yield are such that profitable crop farming is not possible. The findings are elaborated on in this report.

The conclusion is that there is no high potential land on the site. According to the criteria of DALRRD the land is Class 7 or poorer and has a low or medium low sensitivity to agricultural development. There will be no impact regarding the loss of sensitive land.

OHL

The overhead transmission line traverses the property and will be linked. No impact is foreseen.

HE AUTHOR OF THE REPORT CONFIRMS THE FOLLOWING:

3.3.1. Details and relevant experience as well as the SACNASP registration number of the soil scientist specialist preparing the assessment including a curriculum vita;	Dr Andries Gouws is a soil scientist and is registered with SACNASP. Refer to Sections 11.2 and 11.3.
3.3.2. A signed statement of independence by the specialist;	Refer to the preamble of the report.
3.3.3. A map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the national environmental screening tool;	See Figure 6 for the development footprint. Although the screening tool indicate highly sensitive land, the detailed assessment found that the climatic conditions and crop yield are such that profitable crop farming is not possible.
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;	The survey area was confined to the land where the PV will be installed.
3.3.5. Confirmation that the development footprint is in line with the allowable development limits contained in Table 1;	The allowable limit is 2,5ha per MW which is for Land Capability rating 1 to 7. The footprint size is within the allowable limit.

<p>3.3.6. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimize fragmentation and disturbance of agricultural activities;</p>	<p>No micro siting is possible. The total site on the even sloped western section will be developed. The development will not disturb any adjacent farming activities.</p> <p>The site will be not be subdivided in terms of Act 70. It will, therefore not lead to fragmentation of farm land.</p>
<p>3.3.7. A substantiated statement from the soil scientist or agricultural specialist on the acceptability of the proposed development and a recommendation on the approval of the proposed development;</p>	<p>The PV site development takes place on low/medium potential land that has a low/medium sensitivity related to agriculture. This grading for site sensitivity was determined by the specialist following a detailed assessment of the site. The site consists of moderately deep and shallow and rocky soils. The climate is not suitable for viable commercial crop production – see Section 7.2 and 6 for the motivation on why the land is only moderately sensitive.</p> <p>It is the author’s opinion that there is no reason to prevent the project from being implemented.</p> <p>Further, any measure or project that can help to relieve the country’s electricity problems should be encouraged.</p>
<p>3.3.8. Any conditions to which this statement is subjected</p>	<p>There are no conditions imposed on the approval of the project.</p>
<p>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.</p>	<p>The PV site is not a linear activity.</p> <p>The OHL between the facility substation and the Eskom collector switching station is a linear feature. Some land may have to be cleared from trees during installation, and will take time to recover. However, only the transmission line footprint will be disturbed and by planting locally occurring grass species, the grazing land will have no negative impact.</p>
<p>3.3.10. Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr; and</p>	<p>No particular management requirements are proposed. It is, however, recommended that a stormwater management plan be implemented.</p>
<p>3.3.11. A description of the assumptions made and any uncertainties or gaps in knowledge or data.</p>	<p>The observations are accepted as representative of the soil conditions. The author feels confident that this is the case.</p> <p>There were sufficient observations made that no gaps in knowledge or data is expected.</p>
<p>The duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;</p>	<p>Assessment date: August 2023. The duration, date and season of the site inspection and the significance of the season to the outcome of the assessment is not relevant. The main criteria for farming potential are soils, climate and water availability. These are not bound to seasons.</p>

2 BACKGROUND

Index (Pty) Ltd was appointed by Conserva Environmental Management Services to do an Agricultural Compliance Statement for the site.

The affected property is Portion 1 of Zwartwitpensbokfontein 434-KQ. It is located next to the D1234 Northam-Koedoeskop Road at Koedoeskop.

The Agricultural Compliance Statement will support and inform two applications i.e., Special Consent use application to the DALRRD including an application for environmental authorisation to DFFE . The Agricultural Compliance Statement must be undertaken following the Protocols for assessment and minimum criteria for reporting on identified themes published under GNR 320 and GNR 1150 under NEMA.

PROJECT DETAILS

- Project: 480MW solar photovoltaic facility
- Applicant: Allied Green Energy (Pty) Ltd
- Site: Portion 1 of the farm Zwartwitpensbokfontein 434 KQ
- The property is approximately 375 hectares of which the Solar PV footprint area is 230ha.
- The solar facility will connect to the existing 132 KV Spitskop Mamba power line crossing property.

MOTIVATION FOR THE SITE

- The property falls outside the Crocodile River West Irrigation Scheme area and no water rights available.
- Dryland farming is not feasible in the Koedoeskop District due to the climate.
- Currently only grazing/game is kept.
- Solar project will contribute to food security supplying local farmers with consistent power.

The location is indicated in Figure 1.

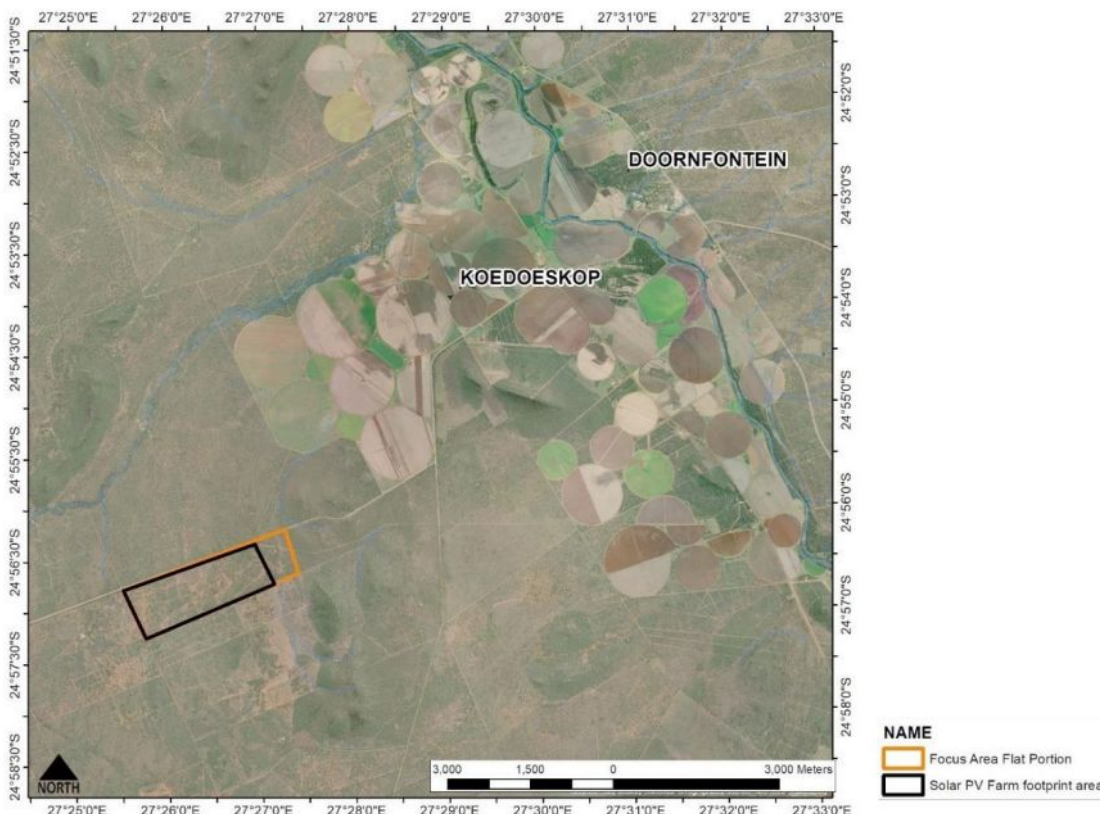


Figure 1. Locality of the project

3 TERMS OF REFERENCE

Index was appointed as agricultural specialist to assess the land proposed for the PV development project. The TOR for this solar project, is indicated below.

APPROACH

- Determine agricultural potential in the Project's footprint.
- Determine impacts of the Project from an agricultural perspective.
- Suggest suitable mitigation measures to address the identified impacts.

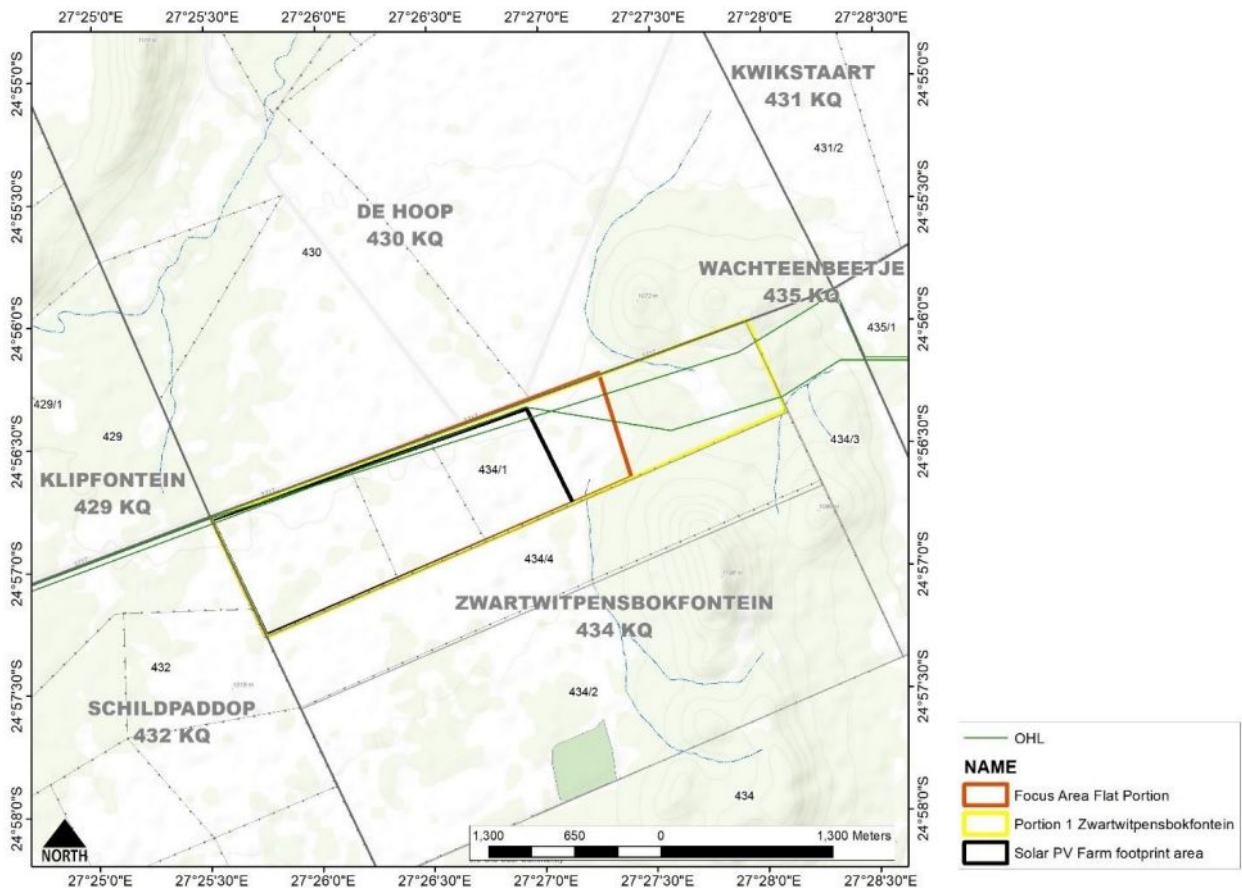


Figure 2. Cadastral information for the site

4 METHODS AND PROCEDURES

SITE SENSITIVITY VERIFICATION

The verification is a review of existing information on soils and topography on a desktop level to determine areas with high sensitivity in terms of Notice 320 of the National Environmental Management Act in May 2020 of the Department of Environmental Affairs.

The current use of the land and the environmental sensitivity of the site are available in the screening tool, and were used in assessing the site.

- The desktop verification was done by use of satellite imagery and a site visit in August 2023.
- The aim was to verify the findings of the interpretation done on the satellite images and of the data obtained from the Screening Tool.

- A separate Site Verification Report was not compiled. The findings of the initial investigation were incorporated into the compliance statement.
- The outcome of the site verification is included in this report.

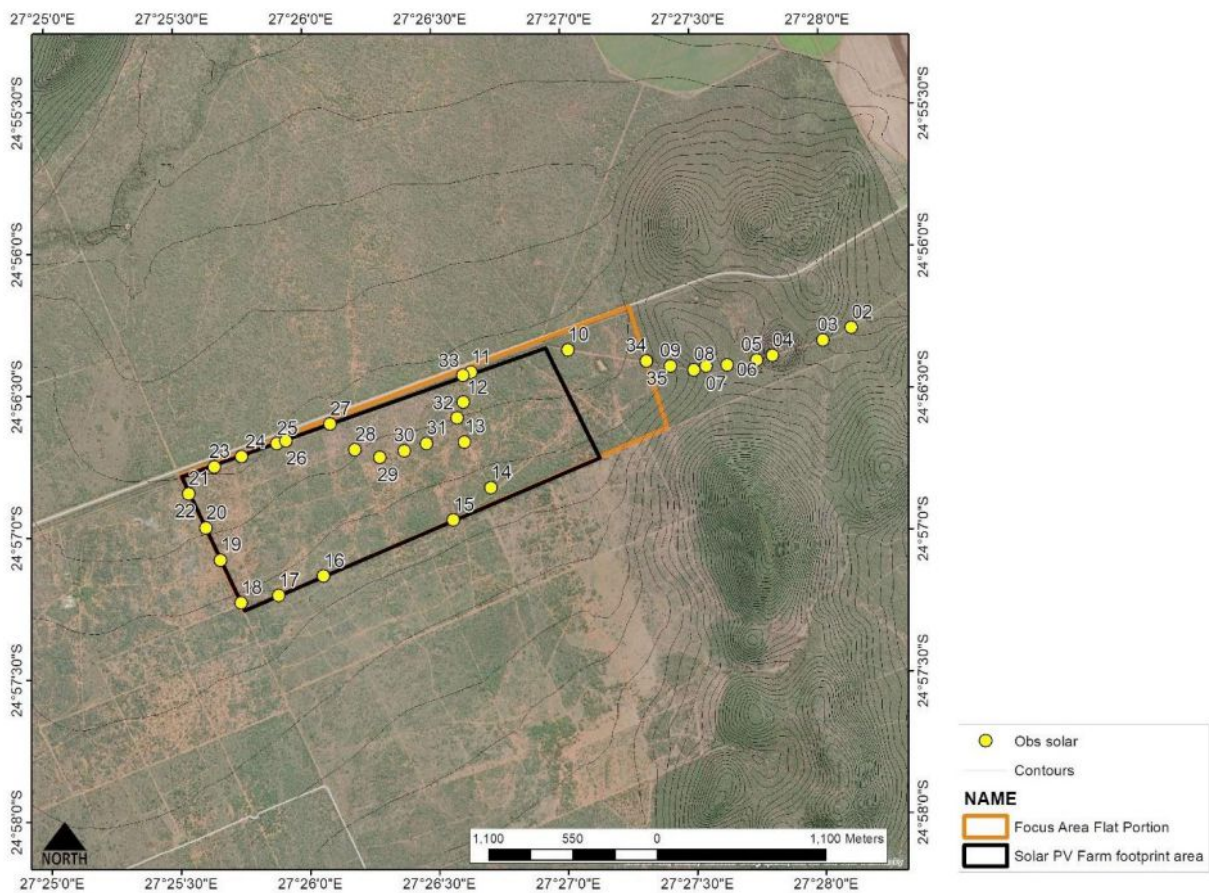
The report compared the current crop land and the environmental sensitivity as identified by the screening tool with the present situation.

SITE EVALUATION PROCESS

Satellite images were used as backdrop and the present land uses digitised.

Soil profiles were augured to determine soil depth, clay content and land conditions.

Capability classification is according to the guidelines published on the AGIS website of the National Department of Agriculture (NDA) was used to determine the capability of soils and their agricultural potential (DALRRD, 2019).



5 PROPOSED DEVELOPMENT

The project consists of a PV site and the associated infrastructure. The development will take place on Zwartwitpensbokfontein 434KQ.

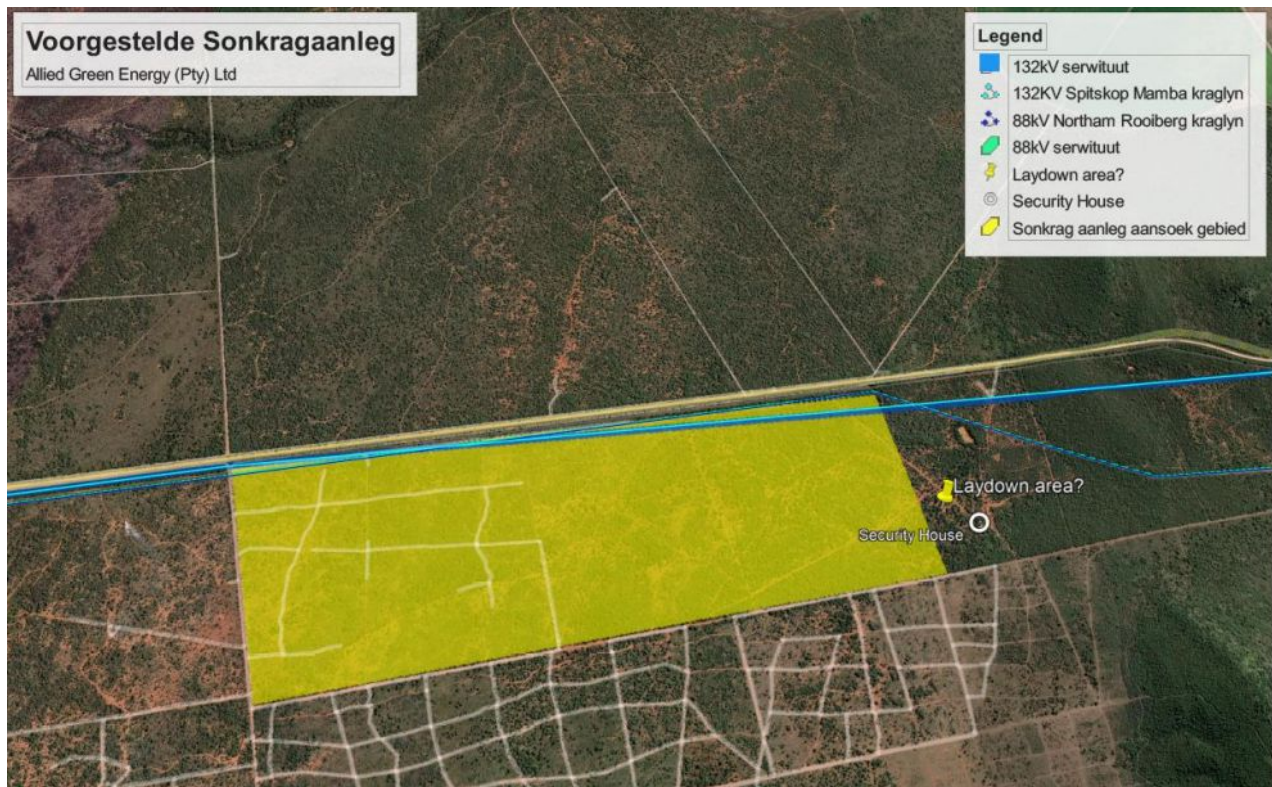


Figure 3. Farm portions affected by the development

6 SITE EVALUATION

6.1 PRESENT LAND USES

The land is undisturbed natural veld, which is used as animal grazing and browsing, mainly by wildlife.

North-east is irrigated land that sources its water from the Crocodile River. The site is approximately 9km from the river. Which is too far to pump irrigation water. There is also irrigable land closer that is available.

No rainfed land was identified in the area.

6.2 CLIMATE

The long-term average rainfall is 574mm per year. This rainfall, especially because the monthly and annual rainfall is highly variable, this makes crop production risky. Because of this, there is no commercial production of summer crops.

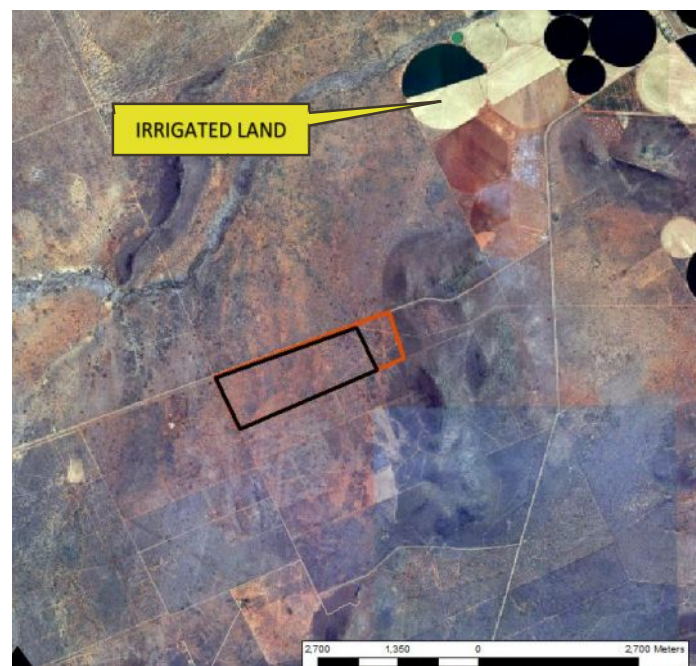


Figure 4. Regional land uses

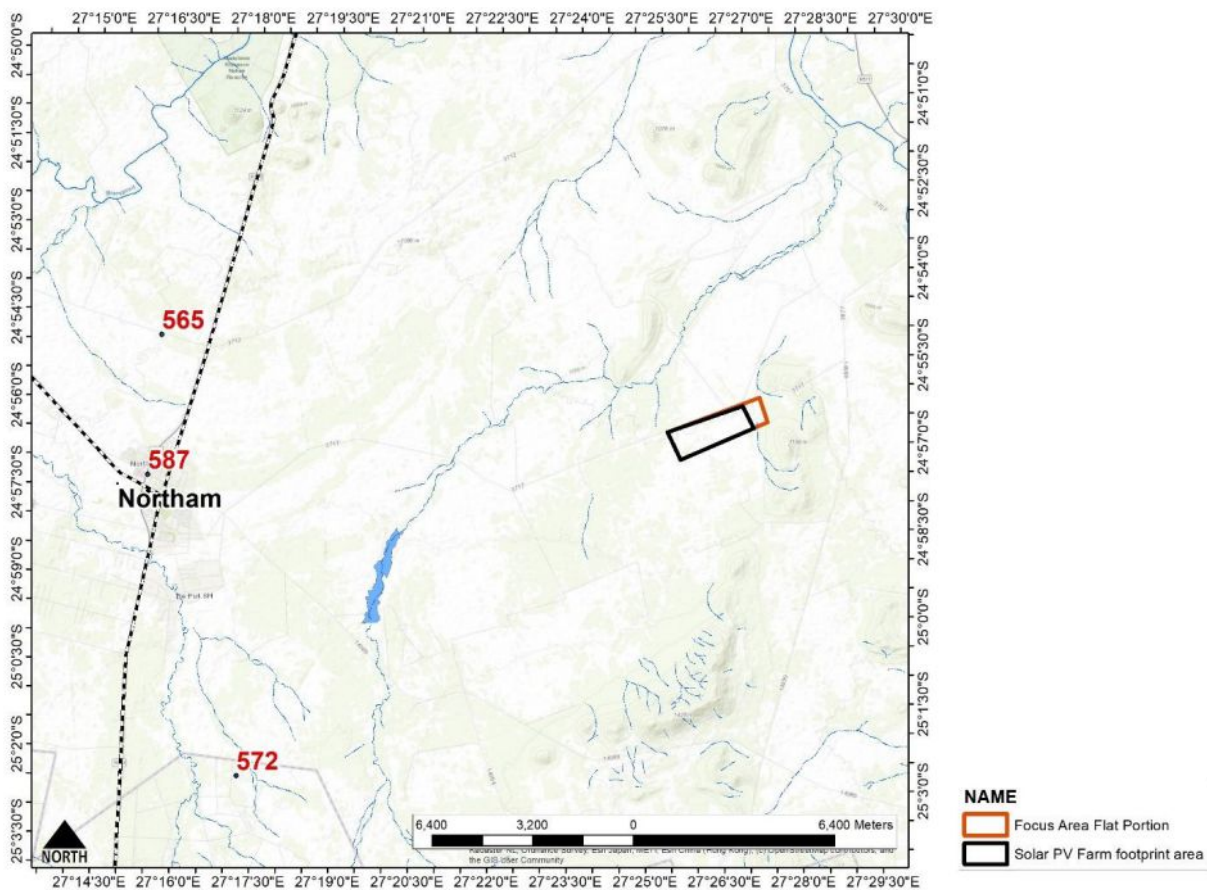


Figure 5. Average annual rainfall

According to DALRRD criteria for the input to the Climate Capability, the site is within Category 5, which is medium capability. This implies that the reliability is too low for commercial rainfed cropping.

The climate is not suitable for crop production, which was also indicated by AGIS of DALRRD. This is also the reason why, once climate is incorporated in the land use capability, the capability was downgraded from high to low.

6.3 SOIL PROPERTIES

SOIL TYPES

The PV site is located on shale that gave rise to variable depth, moderately deep or deep sandy loam soil with a granular texture. It is reddish or dark brown. The subsoil may have rounded medium sized stones or partially weathered sedimentary rock.

Soil types identified are Shortlands and Hutton with shallower rocky portion in the northwestern portion. The soil potential according to DALRRD is Capability Class 7, which is low/moderate.

Soil potential is not a deciding criterion for land use capability or sensitivity in the contexts of the protocols in Notice 320 of the National Environmental Management Act in May 2020 of the Department of Environmental Affairs, because it is not the most limiting factor that would decide sensitivity.

In general, because of the low variable rainfall, the land is not arable and only suitable for grazing.

6.4 VEGETATION

The land in its natural state is bushveld with highly palatable grass species. The veldtype is Dwaalboom Thornveld of the Central Bushveld Biome.

It is characterized by a mix of grasses, shrubs, and trees that are adapted to the semi-arid climate conditions of the area. Some of the typical vegetation found on the site are:

Grass species identified are Red Grass (*Themeda triandra*), Buffalo Grass (*Panicum maximum*), Umbrella Thorn Grass (*Cymbopogon plurinodis*), Finger Grass (*Digitaria* spp.), *Sporobolus* spp., *Cymbopogon* spp., *Andropogon* spp. and *Heteropogon* spp.

Acacia species are common. These trees are well-adapted to the dry conditions. Other trees are marula (*Sclerocarya birrea*), knobthorn (*Senegalia nigrescens*), and Blinkblaar-wag-'n-bietjie (*Ziziphus mucronata*).

The western section of the farm is severely encroached by *Dichrostachys cinerea* (Sekelbos) that restricts access for livestock. The likely reasons for its encroachment can be contributed to the plant's ability to fix atmospheric nitrogen, which gives it a competitive advantage in nutrient-poor soils. Further, overgrazing, land clearing, and changes in land use patterns can create conditions that favour the spread of invasive species like Sekelbos.

There are many bare soil patches that indicate drought in the recent past and where grass has not yet recovered.

The grazing capacity according to DALRRD is estimated at 7 ha/large livestock unit (LSU). However, due to the bush density the grazing capacity is much lower, and without bush-clearing is likely to be as low as 15 to 20ha per LSU.

The carrying capacity for the PV site is less than 15 cattle. By clearing the land from invasive sekelbos and then controlling the density one could increase the carrying capacity to around 30 or more.



Photo 1. Severe encroachment of *Dichrostachys cinerea* (Sekelbos) and areas of bare soil

6.5 WATER

There is no irrigation on the property and even in the unlikely event of being granted as water use licence, the pumping from the Crocodile River is too great to economically irrigate.

6.6 CROP YIELD

Yield is an indicator of the potential viability of crop production of a piece of land. DALRRD published long term yield predictions based on climate in their AGIS website.

The crop yield was calculated by ACRU Maize Yield Model (Domelo, 1990; Schulze, 1995). According to their model, the long term estimated yield for the region is around 2,8t/ha/year. This assumes that the land is arable, with high potential soil.

The yield is too low to cover the production costs for commercial maize production (see next section for the financial impact).

6.7 LAND CAPABILITY

In 2002 the Directorate: Land Use and Soil Management within DALRRD developed a national spatial land capability data set to indicate the spatial delineation of the then defined eight land capability classes. The approach followed was based on the approach of Klingebiel and Montgomery (1961) but adapted for South Africa. The aim was to develop a system for soil and land capability classification. It further incorporated the parameters within a Geographic Information System (GIS). The resulted spatial data set was derived at from a 1:250 000 land type data set being the main input data set for the derived land capability classes together with climatic and terrain parameters.

This dataset is used within the screening tool.

While the new dataset is more complex than that of Klingebiel *et al*, the latter has clear guidelines and is generally still followed when assigning capability to land. A comparison between the two systems is provided below.

Table 1. Relationship between grading of the Screening tool and that of Klingebiel et al.

DALRRD (2016)	Klingebiel	Capability	Arability
1-2	viii	Very low	Not arable
3-4	vii	Very low to low	
5-6	vi	Low	
7	v	Low to moderate	
8	iv	Moderate	Arable
9-10	iii	Moderate to high	
11-12	ii	High	
13-14	i	High to very high	
15	i	very high	

Land capability classes are interpretive groupings of land with similar potential and limitations or similar hazards. Land capability involves consideration of difficulties in land use owing to physical land characteristics, climate and the risks of land damage from erosion and other causes.

According to the soil capability classification, the soils have moderate/high capability (or sensitivity as related to the Screening Tool).

According to Klingebiel *et al*, the soil capability is Class v and lower, mainly because of climate that is not conducive to rainfed cropping, regardless of soil properties.

Using the same criteria as AGIS, the farm is Class 7 or poorer, which is has a *low/moderate* sensitivity.

CONCLUSIONS

The most limiting factor will decide the land use capability. In this instance it is determined by climate.

Capability class	Description
Soil capability is Class 9/10 (DALRRD)	Moderate/high
Climate capability is Class 7 (DALRRD)	Low/moderate
Land use capability	Low/moderate

7 ECOLOGICAL SENSITIVITY – SCREENING TOOL

BACKGROUND

The Department of Forestry, Fisheries and Environment published Notice 320 in 2020 that describes the minimum criteria when applying for environmental authorisation.

This protocol provides the criteria for the assessment and reporting of impacts on agricultural resources for activities requiring environmental authorisation. The assessments requirements of this protocol are according to the level of environmental sensitivity as indicated by the national web-based environmental screening tool for agricultural resources. It is based on the most recent land capability evaluation as provided by the DALRRD.

According to the protocol, an applicant intending to undertake an activity where it occurs on land with ‘*very high*’ or ‘*high*’ sensitivity for agricultural resources must submit an Agricultural Agro-Ecosystem Specialist Assessment. Alternatively, a Compliance Statement will suffice.

7.1 Finding of the Screening tool

FIELD CROP BOUNDARY

There are no field crops on the site.

LAND SENSITIVITY

The screening tool indicates the sensitivity of the site as *high* in general and *moderate* on small portions in the east.

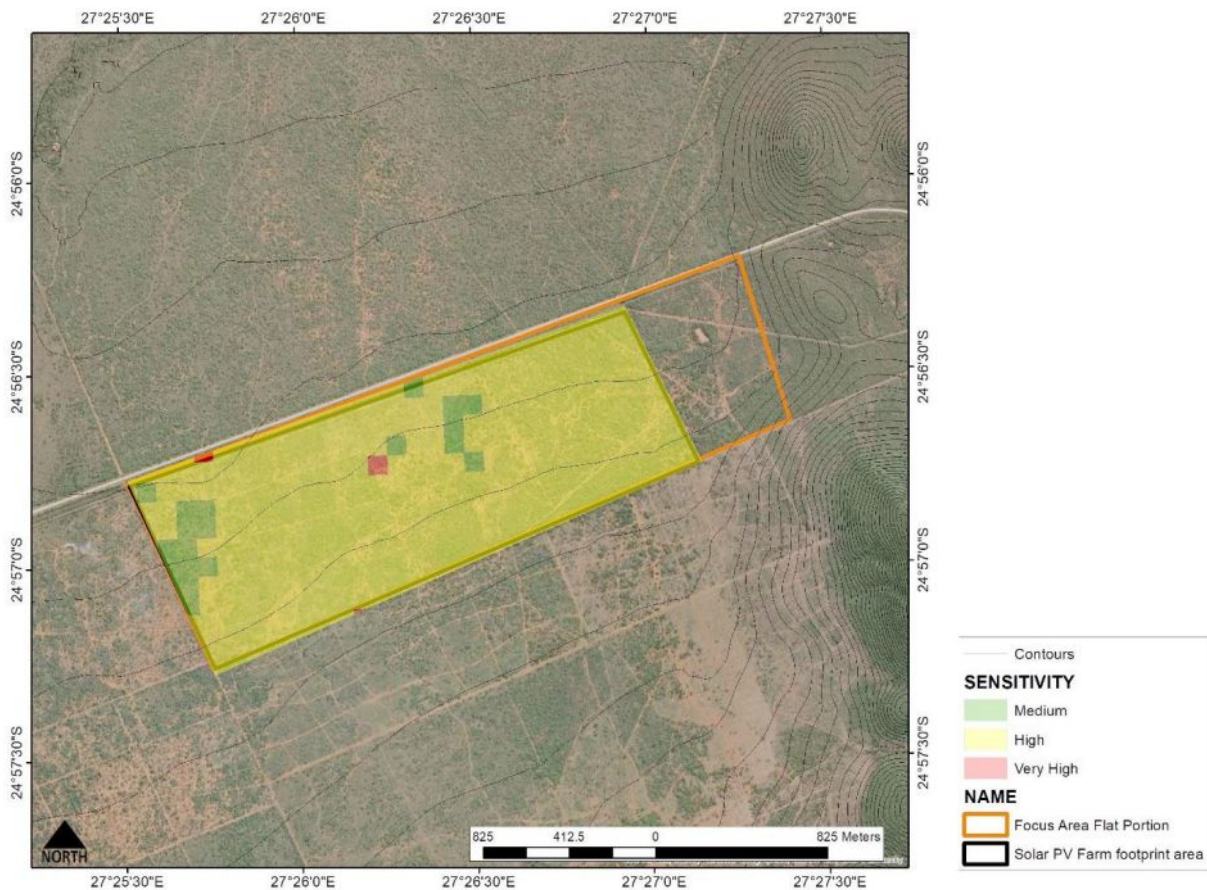


Figure 6. Sensitivity (tool)

7.2 FINDINGS OF THE SITE SENSITIVITY VERIFICATION

Verification is normally done by desk top analysis, using satellite imagery, followed by a site inspection. The outcome of the site sensitivity verification found the following:

FIELD CROP BOUNDARY

- The evaluation agrees that there are no field crops on the site.

LAND CAPABILITY

- The environmental sensitivity according to the tool is indicated as high and moderately sensitive. This is not the case; while much of the land has moderately deep soils, the erratic and low rainfall and high summer temperatures reduces the *land use capability* to low/medium. This is reflected by the low carrying capacity for livestock as well as the low projected crop yield. (This is discussed in detail in Section 6.) As stated in that section, the potential income from cropping is not viable. Viability is one of the cornerstones of determining agricultural capability.
- The farm has no cultivated or irrigated lands.
- Using the same guidelines as in AGIS (DALRRD), the land has low/moderate arable potential. This is because of the climatic conditions and its impact on potential crop yield (refer to Section 6). According to the criteria in AGIS the land is not arable and more suitable for livestock.
- In line with the provisions of the Protocol, a compliance statement is required for the EIA scoping report because the detailed survey of the land found that that the capability is low/medium and not high as indicated by the Screening Tool.

VIABILITY OF THE LAND FOR COMMERCIAL CROP PRODUCTION

Regarding the arability of land, the Department contends that agricultural land is considered to have a 'high potential' if it can be cultivated in terms of Part I of the Regulations of the Conservation of Agricultural Resources Act, 43/83.

Cultivation in this context requires:

- That the soil can physically be tilled;
- That it is financially feasible to cultivate land (this incorporates climate, which determines yield);

The purpose of Act 70 of 1970 is to maintain viable farming units. Per implication, farming units and farming potential should be assessed for its economic viability. The Department should, therefore, also consider the site's economic feasibility as a criterion in determining the sensitivity.

The findings of the study related to site sensitivity are as follows:

- The crop yield is too low for commercial crop production if maize is used as indicator crop. Maize at a yield of 2,8 t/ha/year is produced with a negative margin (see Section 7). See Section 11.2 for the gross margin calculations). This is at break-even income.
- Animal production
The livestock carrying capacity at a stocking density of 15ha/LSU, is approximately 15 LSU (medium frame animals is a weaner production system). The projected enterprise income is R105,795 or R8 816.25/month.

ENVIRONMENTAL SENSITIVITY IN TERMS OF NOTICE 320

With the above taken into consideration, it is clear that the site has a low/moderate sensitivity and not high as per the screening tool.



Figure 7. Land sensitivity found after a detailed assessment

8 IMPACT ASSESSMENT

8.1 LOSS OF HIGH POTENTIAL LAND

There will not be permanent loss of high potential land. According to the guidelines of various publications of DALRRD that deals with land capability and crop yield, the land is not high potential. There is also no irrigated land on the property which has to be protected.

Further, the PV infrastructure does not alter the soil properties or land conditions, and once removed, will be suitable for farming.

- The impact is low, temporary and totally reversible.

8.2 LOSS OF AGRICULTURAL PRODUCTION

The livestock carrying capacity at a stocking density of 15ha/LSU, is approximately 15 LSU (medium frame animals is a weaner production system). The projected enterprise income is R105,795 or R8 816.25/month. The grazing opportunity that the farm provides cannot be replaced or mitigated on a national level. As far as the farmer is concerned, the remaining land on the farm can accommodate a part of the 15 animals that would have been used by the land to be placed under PV.

Our national electricity problems far outweigh the loss of income that the farm will sacrifice.

- The impact is low on a regional or national scale
- It is temporary and will be for the medium term.

8.3 LOSS OF AGRICULTURAL INFRASTRUCTURE

No cattle handling facilities or other farming infrastructure are located on the land proposed for the development.

- No agricultural infrastructure will be lost.

8.4 LOSS OF SOIL DUE TO EROSION

The soil is well-drained with moderately developed or single grain structure. It is also on evenly sloped land where erosion is not expected.

Nevertheless, the PV projects creates areas that are cleared of vegetation, and that could be subject to erosion. Runoff from hard surfaces should be dealt with by a Stormwater Management Plan (SMP). This is an engineering function and is normally addressed as part of the project design.

- No impact is expected
- Mitigation is achieved by allowing grass to re-establish after construction and by guidelines in the SMP.

SUMMARY

Table 2. Impact table

Impact	Description	Extent of impact
Loss of high potential agricultural land	No high potential and in terms of HUAL and CARA will be lost. Extent: none. Mitigation: Not applicable.	None
Loss of grazing land	The land is not used for grazing but only by game animals for browsing. The land is severely encroached by sekelbos and will require remedial action to gainfully utilise the vegetation. Approximately 15 LSU can potentially be influenced. Extent: low Mitigation: reclaim the land. This is costly. Probably the most viable option is to establish the PV project and replant the site with pastures when the site is reclaimed.	Low
Loss of food security and farming income	There will be no loss of food production capacity due to the present state of the vegetation. Extent: low Mitigation: reclaim the land. This is costly. Probably the most viable option is to establish the PV project and replant the site with pastures when the site is reclaimed.	Low
Loss of agricultural infrastructure	There is no farming infrastructure on the portion to be developed.	None
Fragmentation of farm land	The farming unit will remain unchanged.	None
Land degradation:	Intensive development can lead to soil degradation due to excessive use of chemicals, improper land management, and erosion. This negatively affects long-term agricultural productivity. The land portion is on even slopes where no industrial activities will take place. No additional impact is foreseen from polluting activities.	None

9 CONCLUSIONS

No high potential and in terms of HUAL and CARA will be lost.

According to the guidelines of various publications of DALRRD that deals with land capability and crop yield, the land is not high potential. There is also no irrigated land on the property which has to be protected.

The land is not used for grazing but only by game animals for browsing. It is severely encroached by sekelbos and will require remedial action to gainfully utilise the vegetation as grazing. Mitigation can be achieved by removing the sekelbos. However, this is costly with the most viable option, to replant the site with pastures when the site is reclaimed.

There will be no loss of food production capacity due to the present state of the vegetation.

There is no farming infrastructure on the portion to be developed.

No subdivision is proposed, the farming unit will remain unchanged.

Intensive development can lead to soil degradation due to excessive use of chemicals, improper land

management, and erosion. However, the land is on even slopes where no industrial activities will take place. No impact is foreseen from polluting activities.

It is the author's opinion that the no reason could be found to prevent the project from being implemented.

10 RECOMMENDATION

The PV site development takes place on low/medium potential land that has a low/medium sensitivity related to agriculture. This grading for site sensitivity was determined by the specialist following a detailed assessment of the site.

The site consists of moderately deep and shallow and rocky soils. The climate is not suitable for viable commercial crop production.

There were no gaps found in knowledge in the investigation. The recommendations made in this report is based on the findings during the investigation.

Any measure or project that can help to relieve the country's electricity problems should be encouraged.

It is the author's opinion that the no reason could be found to prevent the project from being implemented.

11 ADDENDA

11.1 SOURCES OF INFORMATION

- a) Criteria for high potential agricultural land in South Africa, Department of Agriculture, Directorate Land Use and Soil Management, 2002.
- b) Grondklassifikasie Werkgroep, 1991. Grondklassifikasie, 'n Taksonomiese sisteem vir Suid Afrika, Departement van Landbou-ontwikkeling, Pretoria.
- c) Department of Agriculture. Grazing capacity. Development of Agricultural Land Framework Bill , 2016
- d) WRC, 2003 South African Atlas of Agrohydrology and Climatology, Water Research Commission
- e) CROPWAT 8.0 has been developed by Joss Swennenhuis for the Water Resources Development and Management Service of FAO.

11.2 GROSS MARGINS

MAIZE

MAIZE: Yield: t/ha	2.5	2.64	3.5
ALLOCATED COSTS	R7 748.61	R8 146.40	R8 480.09
Pre-plant	R631.28	R631.28	R631.28
Lime	R541.67	R541.67	R541.67
Lime spreading	R95.44	R95.44	R95.44
Disc	R116.94	R116.94	R116.94
Disc (mechanisation)	R120.14	R120.14	R120.14
Plough	R92.36	R92.36	R92.36
Plough (mechanisation)	R211.31	R211.31	R211.31
Plant:	R3 742.22	R3 979.75	R4 217.28
Seed BT	R1 267.49	R1 267.49	R1 267.49
Plant	R53.90	R53.90	R53.90
2.3.2 (30) + S	R1 781.49	R2 019.02	R2 256.55
Guardian S	R216.77	R216.77	R216.77
Terbuzine 600	R40.77	R40.77	R40.77
Mesoflex	R119.58	R119.58	R119.58
Tronic	R17.22	R17.22	R17.22
Flobor	R31.89	R31.89	R31.89
Sumi-Alpha	R25.25	R25.25	R25.25
Plant 0.9 m & Spsit	R187.86	R187.86	R187.86
Plant 0.9 m & Spsit (mechanisation)	R0.00	R0.00	R0.00
Pre-harvest	R2 093.38	R2 253.64	R2 349.80
LAN (28)	R641.05	R801.31	R897.47
Terbuzine 600	R81.53	R81.53	R81.53
Mesoflex	R119.58	R119.58	R119.58
Tronic	R17.22	R17.22	R17.22
Metalachlor 960	R84.18	R84.18	R84.18
Halo	R153.06	R153.06	R153.06
Custodia	R465.56	R465.56	R465.56
Hail insurance	R363.00	R363.00	R363.00
Topdressing	R51.81	R51.81	R51.81
Topdressing (mechanisation)	R65.00	R65.00	R65.00
Spaying	R28.56	R28.56	R28.56
Spaying (mechanisation)	R22.83	R22.83	R22.83
Harvesting	R1 281.73	R1 281.73	R1 281.73
Combine	R401.31	R401.31	R401.31
Combine	R228.31	R228.31	R228.31
Transport (50 Km)	R71.80	R71.80	R71.80
Transport (50 Km)	R228.31	R228.31	R228.31
Labour	R352.00	R352.00	R352.00
FIXED COST	R555.71	R555.71	R555.71
Labour	R555.71	R555.71	R555.71
TOTAL COST PER HECTARE	R8 304.32	R8 702.11	R9 035.80
SALES	R8 000.00	R8 448.00	R11 200.00
GROSS MARGIN	-R304.32	-R254.11	R2 164.20

LIVESTOCK

CATTLE MARGINS	R/LSU
Income	10 750
Costs	3 697
Summer licks	217
Winter licks	652
Vet costs	127
Bull costs	200
Labour	1 046
Pastures	672
Repairs	320
VARIABLE COSTS	463
Marketing	438
Transport	25
Margin	7 053

11.3 SACNASP CERTIFICATE



THE SOUTH AFRICAN COUNCIL FOR NATURAL SCIENTIFIC PROFESSIONS

herewith certifies that

Johan Andries Gouws
Registration number: 400140/06

has been registered as a

Professional Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice
(Schedule I of the Act)

Agricultural Science

11 July 2006
Pretoria


President


Chief Executive Officer

11.4 CURRICULUM VITAE (CV)

Position Title and No.	Agriculture, Land use planning and wetland specialist. INDEX
Name of Expert:	Andries Gouws
Date of Birth	12/04/1955
Country of Citizenship /Residence	South Africa

Education

Name of institution: College/University or other	Degree/diploma/certificate or other specialized education	Date completed
University of Pretoria, South Africa	BSc. Agriculture	1979
University of Bloemfontein	BSc. Honours, Agriculture	1987
Potchefstroom Collage for Agriculture	Diploma: Stereoscopic aerial photo interpretation of natural resources for farm planning	1981
University of South Africa	Diploma: Financial management	1992
University of Trinity	PhD: Integrated agricultural development	2007

Employment record relevant to the assignment:

Period	Employing organization and your title/position. Contact info for references	Country	Summary of activities performed relevant to the Assignment
1993 – current	INDEX - Director and co-owner: Responsibility: Agriculture and land use planning. Contact: Eugene Gouws - Director +27 82 55 33 787	RSA	Provided specialist assessment services in agriculture and land use planning for various development projects.

Membership in Professional Associations and Publications:

Soil Science society of South Africa.

South African Council for Natural Scientific Professions – Registered Professional Scientist (Reg no: 400140/06)

Adequacy for the Assignment:

Detailed Tasks Assigned on Consultant's Team of Experts:	Reference to Prior Work/Assignments that Best Illustrates Capability to Handle the Assigned Tasks
Position: Agricultural Specialist	Agricultural Impact Assessment for the Proposed Mookodi- Mahikeng 400kv Line. 2018. Client: Nema Consulting
	Agricultural Impact Assessment for the Proposed Foxwood Dam 2015 – 2016 Compiled the specialist report on Agricultural impact

	<p>Client: Nemaï Consulting, DWS</p> <p>Agricultural Impact Assessment for the Proposed Mokolo and Crocodile River (West) Water Augmentation Project (MCWAP) (2017 – 2019)</p> <p>Compiled the specialist report on Agricultural impact</p> <p>Client: Nemaï Consulting, DWS</p>
	<p>MSOBO COAL – HARWAR; economic study for the farming enterprises</p> <p>Discussion of the natural resources that influences agricultural potential; Farming and the potential for different enterprises; Indicate the potential income from main enterprises and Indicate the financial impact of the development on the farmers. (2013/4)</p> <p>Client: Demacon</p>
	<p>Agricultural potential study of Portion 21 (Portion 1) of the farm Koppieskraal 1157-IR</p> <p>2019.</p> <p>Client: Adv Johan du Plessis</p>
	<p>Agricultural Potential Assessment: Albany Wind Energy Facility & Grid Infrastructure Near Makhanda, Eastern Cape Province</p> <p>2020</p> <p>Client: CES Environmental and Social advisory Services</p>
	<p>Agricultural potential and impact assessment of Available Land At Mopeia, Mozambique</p> <p>2016</p> <p>Client: Barari Forest Management. Department: Research & Development</p> <p>Abu Dhabi</p>

Expert's contact information: E-mail: index@iafrica.com
Phone: +27 (0) 82 807 6717

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes my qualifications, my experience and myself.

Andries Gouws

Name of Expert



Signature

August 2023

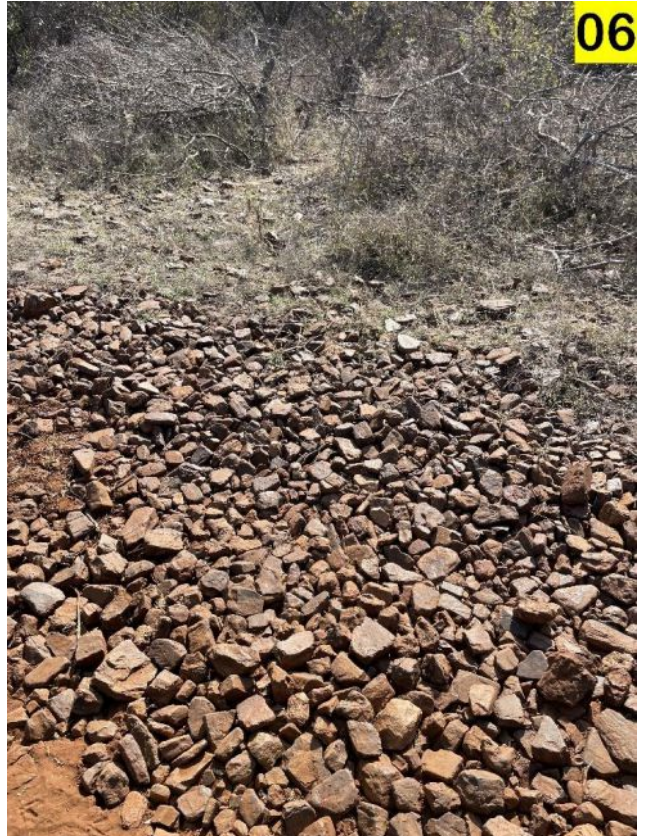
Date

11.5 OBSERVATIONS





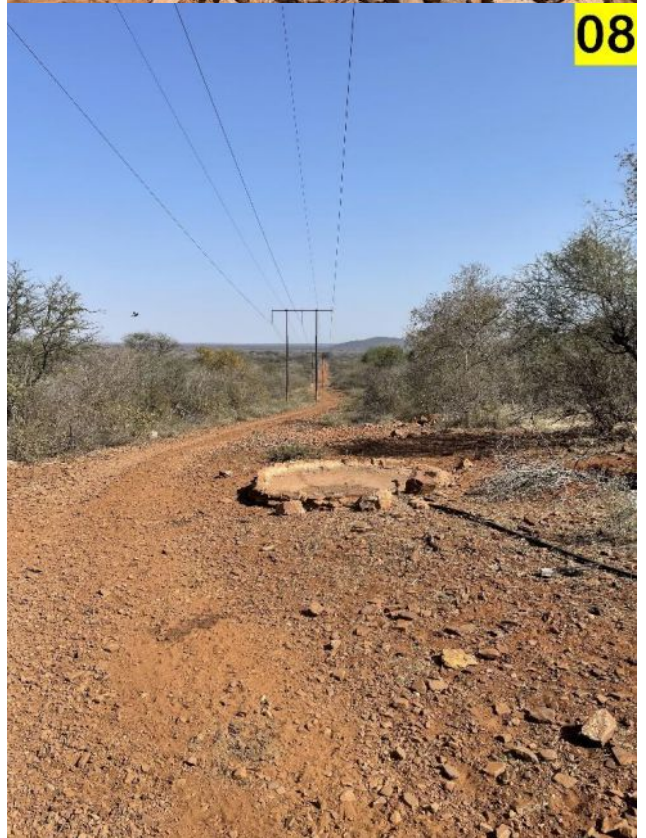
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