

**ENVIRONMENTAL IMPACT ASSESSMENT PROCESS  
DRAFT BASIC ASSESSMENT REPORT**

**PROPOSED STELLA HELPMEKAAR  
SOLAR ENERGY FACILITY  
NEAR STELLA, NORTH WEST PROVINCE  
(DEA REF NO: 14/12/16/3/3/1/1091)**

**FINAL BASIC ASSESSMENT REPORT**

**MARCH 2014**

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## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

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**File Reference Number:**

**Application Number:**

**Date Received:**


Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

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15. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

## PROJECT DETAILS

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<b>Title</b>	:	Environmental Basic Assessment Process Final Basic Assessment Report: Proposed Stella Helpmekaar Solar Energy Facility, near Stella, North West Province
<b>Authors</b>	:	Savannah Environmental Steven Ingle Karen Jodas
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<b>Applicant</b>	:	Bluewave Capital SA (Pty) Ltd
<b>Report Status</b>	:	Final Basic Assessment Report

**When used as a reference this report should be cited as:** Savannah Environmental (2013) Final Basic Assessment Report: Proposed Stella Helpmekaar Solar Energy Facility, near Stella, North West Province

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## **SUMMARY AND OVERVIEW OF THE PROPOSED PROJECT**

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Bluewave Capital, an Independent Power Producer (IPP), is proposing the establishment of a small-scale commercial solar energy facility (using photovoltaic technology) of approximately 5 MW in capacity. The facility is proposed to be located approximately 45km north-west of the town of Stella, on Portion 2 of the Farm Helpmekaar 248 IN, in the North West Province. The proposed project will be referred to as the **Stella Helpmekaar Solar Energy Facility**.

### **Project need and desirability**

**Immediate need and desirability of the project:** Eskom is constructing a 400kV line into Vryburg. There are some plans to build a substation between Stella and Edwardsdam but these plans still need to be finalized. Edwardsdam Substation currently has a single 88kV power line that feeds it as well as a new 132kV line is running from Vryburg. This 88kV power line is very long and incurs significant losses. Edwardsdam Substation feeds all the power in a ~60km radius and there has been some significant population growth in the nearby vicinity. Furthermore there are many farms with irrigation pumps that source their power from the Edwardsdam Substation.

The above factors have placed a significant burden on the Edwardsdam Substation capacity. Eskom has recently installed a new 88/22 kV transformer at the substation to mitigate some of the problems, however it is clear that the capacity constraint lies with the 88kV power line. This is the main reason Eskom is bolstering the capacity at the substation with the 132kV line. A 5MW solar PV electricity generating facility feeding directly into the 22kV busbar at the Edwardsdam Substation will alleviate a significant portion of the capacity burden at the Substation. Furthermore this generation facility will ensure grid stability as these remote portions of the country, with their capacity constraints, are usually the worst affected by brown and blackouts.

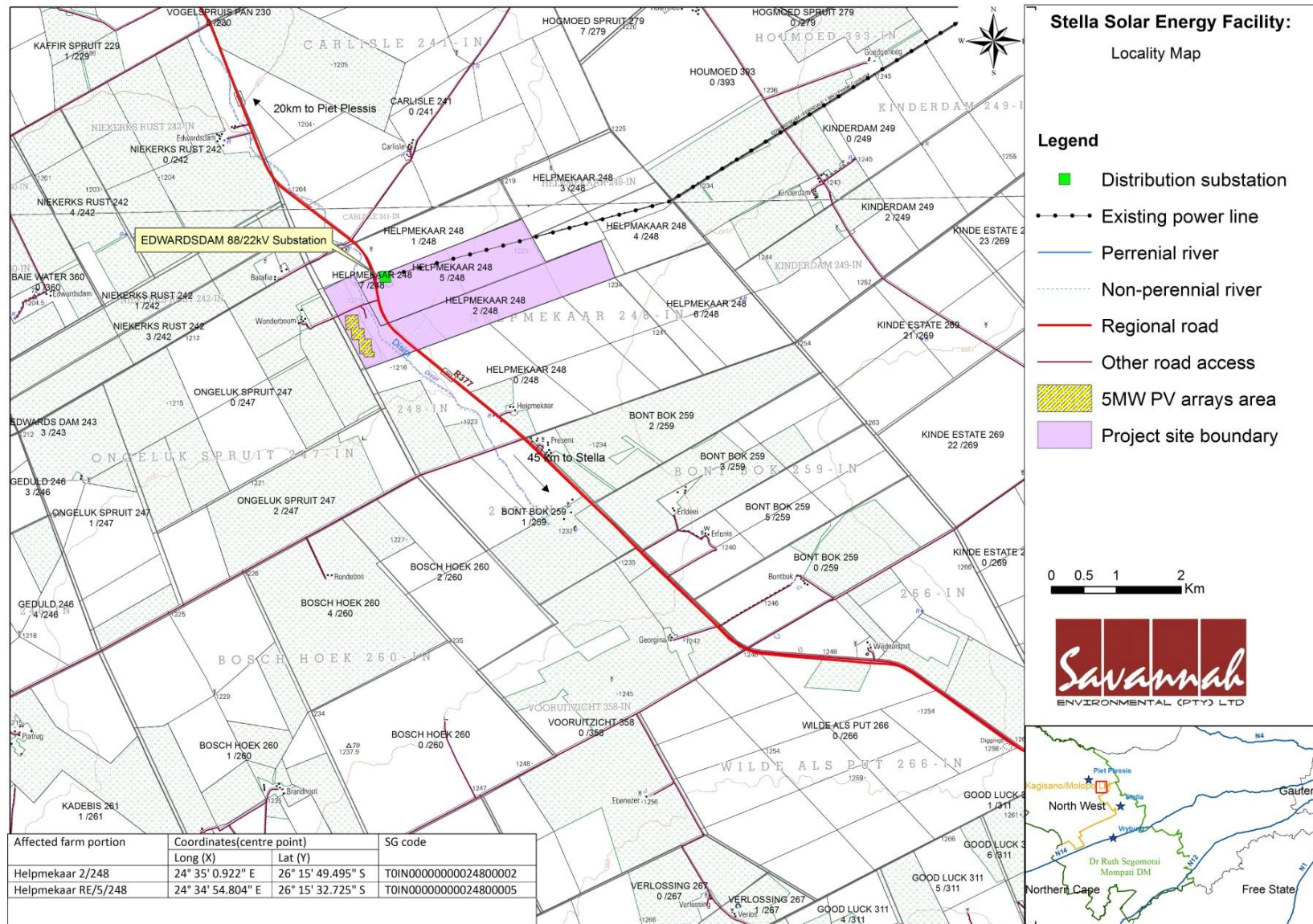
**National perspective:** The purpose of the project is to generate electricity which will be fed-into the national electricity grid. The project will participate in the Department of Energy's Small Projects Renewable Energy Independent Power Producer Procurement (REIPPP) Programme. The REIPPP Programme has been designed to contribute towards the South African government's renewable energy target of 17GW by 2030, and to stimulate the renewable industry in South Africa.

The facility development footprint will be less than 19.5 ha in extent within which the following infrastructure will be established:

- » Photovoltaic (PV) panels up to 4-6m in height (fixed or tracking technology) with a capacity of up to 5MW.

- » Mounting structures to be either rammed steel piles or piles with pre-manufactured concrete footing to support the PV panels.
- » Cabling between the project components, to be lain in trenches ~ 1-2m deep.
- » Power inverters between the PV arrays ( $\pm 4.5\text{m}^2$ ).
- » Power line to evacuate the power into the Eskom grid via the Edwardsdam 88/22kV Substation.
- » Internal access roads (up to 7m wide).
- » Water storage facilities/ reservoirs ( $1\ 000\ \text{m}^3$ ).
- » Office, workshop area for maintenance and storage ( $50\text{m}^2$ ).
- » During construction (temporary infrastructure) such as a laydown area ( $\sim 1$  hectare in extent) will also be required.
- » Fencing.





**Figure 1:** Locality map showing the proposed Stella Helpmekaar Solar Energy Facility 5MW PV facility within the larger farm portion

## 1.1 NEED FOR THE PROPOSED DEVELOPMENT

**Immediate need and desirability of the project:** Eskom is constructing a 400kV line into Vryburg. There are some plans to build a substation between Stella and Edwardsdam however these plans still need to be finalized. Edwardsdam Substation currently has a single 88kV power line that feeds it as well as a new 132kV line is running from Vryburg. This 88kV power line is very long and incurs significant losses. Edwardsdam Substation feeds all the power in a ~60km radius and there has been some significant population growth in the nearby vicinity. Furthermore there are many farms with irrigation pumps that source their power from the Edwardsdam Substation.

The above factors have placed a significant burden on the Edwardsdam Substation capacity. Eskom has recently installed a new 88/22 kV transformer at the substation to mitigate some of the problems, however it is understood that the capacity constraint lie with the 88kV power line. This is the main reason Eskom is bolstering the capacity at the Edwardsdam substation with the 132kV line. A 5MW solar PV electricity generating facility feeding directly into the 22kV busbar at the Edwardsdam Substation will alleviate a significant portion of the capacity burden at the Substation. Furthermore this generation facility will ensure grid stability as these remote portions of the country, with their capacity constraints, are usually the worst affected by brown and blackouts.

**National perspective:** Due to the exploitation of and large-scale reliance on non-renewable resources and the potential subsequent impacts on climate, there is increasing pressure globally to increase the share of renewable energy generation. South Africa currently depends on fossil fuels for the supply of approximately 90% of its primary energy needs. With economic development over the next several decades resulting in an ever increasing demand for energy, there is some uncertainty as to the availability of economically extractable coal reserves for future use. Furthermore, several of South Africa's coal-fired power stations are nearing the end of their economic life, require refurbishment, or have been recently returned to service (re-commissioned) at great expense (i.e. the Camden, Komati, and Grootvlei Power Stations).

The current electricity imbalances in South Africa highlight the significant role that renewable energy can play in terms of power supplementation. Given that renewables can generally be deployed in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality, while reducing expensive transmission and distribution losses. At present, South Africa is some way off from exploiting the diverse gains from renewable energy and from achieving a considerable market share in the industry. In order to meet the long-term goal of a sustainable renewable energy industry, a target of 17.8 GW of renewables by 2030 has been set by the Department of Energy (DoE) within the Integrated Resource Plan (IRP) 2010 and incorporated in the REIPPP Programme. This energy will be produced from various renewable energy technologies including solar energy facilities (i.e. such as PV

technology). The proposed project is to contribute towards this goal for renewable energy.

## **1.2 REQUIREMENT FOR AN ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

In terms of the EIA Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA, Act No. 107 of 1998), authorisation is required from the National Department of Environmental Affairs (DEA) as the competent authority as mandated in terms of the Energy Response Plan, in consultation with the North West Department of Economic Development, Environment and Tourism (NWDEDET) for the establishment of the proposed solar energy facility. In terms of sections 24 and 24D of NEMA, as read with the EIA Regulations of GN R544 – R546 (as amended), a Basic Assessment process is required to be undertaken for the proposed project. An application has been submitted to the DEA.

An environmental impact assessment is an effective planning and decision-making tool for the project developer as it provides the opportunity for the developer to be forewarned of potential environmental issues and to assess if potential environmental impacts can be avoided, minimised or mitigated to acceptable levels. The Basic Assessment process forms part of the feasibility studies for a proposed project and will inform the final design process in order to ensure that environmentally sensitive areas are avoided as far as possible. Comprehensive, independent environmental studies are required in accordance with the EIA Regulations to provide the competent authority with sufficient information in order to make an informed decision.

## **1.3 DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER AND EXPERTISE TO CONDUCT THE BASIC ASSESSMENT PROCESS**

Savannah Environmental was contracted by Bluewave Capital SA (Pty) Ltd as the independent environmental consultant to undertake the Basic Assessment process for the proposed solar energy facility. Neither Savannah Environmental, nor any of its specialist sub-consultants on this project are subsidiaries of, or are affiliated to Bluewave Capital SA (Pty) Ltd. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

Savannah Environmental is a specialist environmental consultancy which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment

and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

The Savannah Environmental team has considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa, including those associated with electricity generation, specifically from renewable sources.

The EAPs from Savannah Environmental who are responsible for this project are:

- » Steven Ingle, the principle author of this report, holds a Bachelors degree in Environmental Management and has 8 years experience in environmental management and has undertaken numerous EIAs for a number of proposed large-scale infrastructure project and renewable energy facilities across South Africa.
- » Karen Jodas is a registered Professional Natural Scientist and holds a Master of Science degree. She has 16 years of experience consulting in the environmental field. Her key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. She is currently responsible for the project management of EIAs for several renewable energy projects across the country.

In order to adequately identify and assess potential environmental impacts, several specialists have been appointed to conduct specialist studies, as required:

<b>Specialist Studies Undertaken</b>	<b>Specialists</b>
Ecology Impact Assessment	Simon Todd of Simon Todd Consulting (Ecologist)
Soil and Agricultural Potential Impact Assessment	Johann Lanz (Soil Scientist)
Heritage Impact Assessment	Jaco van der Walt of Heritage Contracts and Archaeological Consulting (Archaeologist)
Palaeontology Study	Dr John Almond (Palaeontologist)
Visual Impact Assessment	Karen Hansen (Visual specialist)

Curricula vitae for the Savannah Environmental and specialist project team are included in **Appendix J1**.

## **DRAFT BASIC ASSESSMENT REPORT FOR REVIEW**

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The Draft Basic Assessment Report was made available for public review at the following venues:

- » Stella Library – 175 Stella Street, Stella
- » [www.savannahSA.com](http://www.savannahSA.com)

The 30-day period for review period was from **6 December 2013 – 24 January 2013.**

Written comment were to be forwarded to:

Please submit your comments to:
<b>Gabriele Wood</b> of <b>Savannah Environmental</b> Post: PO Box 148, Sunninghill, Johannesburg, 2157 Telephone: 011 656 3237 Fax: 086 684 0547 Email: <a href="mailto:gabriele@savannahsa.com">gabriele@savannahsa.com</a>
The due date for comments on the Draft Basic Assessment Report was <b>24 January 2013.</b>

## SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?  NO ✓

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

### 1. PROJECT DESCRIPTION

**Describe the project associated with the listed activities applied for**

Bluewave Capital is proposing the establishment of a small-scale commercial solar energy facility (using photovoltaic technology) of approximately 5 MW in capacity. The proposed project will be referred to as the Stella Helpmekaar Solar Energy Facility. The facility is proposed to be located approximately 45km north-west of the town of Stella, on Portion 2 of the Farm Helpmekaar 248 IN, in the North West Province.

The facility development footprint will be less than 19.5 ha in extent within which the following permanent and temporary infrastructure will be established:

- » Photovoltaic (PV) panels up to 4m in height (fixed or tracking technology) with a capacity of up to 5MW.
- » Mounting structures to be either rammed steel piles or piles with pre-manufactured concrete footing to support the PV panels.
- » Cabling between the project components, to be lain in trenches ~ 1-2m deep.
- » Power inverters between the PV arrays ( $\pm 4.5\text{m}^2$ ).
- » A distribution power line to evacuate the power into the Eskom grid via the Edwardsdam 88/22kV Substation situated within 700m from the proposed PV site.
- » Internal access roads (up to 7m wide).
- » Water storage facilities/ reservoirs ( $1\ 000\ \text{m}^3$ ).
- » Office, workshop area for maintenance and storage ( $50\text{m}^2$ ).
- » Temporary housing for workers and a laydown area ( $\sim 1$  hectare in extent) will also be required.
- » Fencing.

**General site description:** Portion 2 of the Farm Helpmekaar 248 IN is privately owned land situated within the Kagisano-Molopo Local Municipality. The greater farm portion is traversed by the R377 which connects the towns of Stella to the south and Piet Plessis to the north. The farm is situated in a very flat Highveld plateau with almost no relief (slope of less than 1%) at an elevation of 1 220 m above sea level. The area of the greater farm portion to the west of the R377 where the PV facility is proposed to be developed is characterised by croplands (dryland bean production) as well as grasslands used for grazing. The area to the east of the R377 where the

Edwardsdam Substation is situated is characterised by croplands to a lesser extent but dominated by natural bushveld. The Edwardsdam / Ferndale 1 88kV power line which feeds into the Edwardsdam Substation located on the farm traverses the entire farm portion.

**Footprint:** The footprint of the facility including all temporary laydown areas will exceed 10ha in extent but will not exceed 19,5ha in extent. It is anticipated that the final footprint of the 5MW facility will be approximately 16ha.

**Critical Biodiversity Areas and threatened ecosystems:** In terms of the North-West Province Biodiversity Conservation Assessment which maps Critical Biodiversity Areas and Ecological Support Areas within the North West Province, the south-western section of the site which includes the proposed PV development area lies within a Tier 2 Critical Biodiversity Area. The remainder of the site is mapped as falling within a threatened ecosystem (Vulnerable).

### **1. Components of the PV Facility**

The main components of the PV facility will comprise of the following:

#### **Photovoltaic Cells**

Solar energy facilities, such as those using PV panels, use the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. This effect refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity.

Solar photovoltaic (PV) panels consist primarily of glass and various semiconductor materials and in a typical solar PV project, will be arranged in rows to form solar arrays. The PV cell is positively charged on one side and negatively charged on the other side and electrical conductors are attached to either side to form a circuit. This circuit then captures the released electrons in the form of an electric current (direct current). An inverter must be used to change the direct current (DC) it to alternating current (AC). The electricity is then transmitted through a power line for distribution to the grid and use. The PV panels are designed to operate continuously for more than 25 years with minimal maintenance required.



**Figure 2:** Photovoltaic panels (Photo courtesy of BlueWave Capital SA)

A single cell is sufficient to power a small device such as an emergency telephone. However, to produce 5 MW of power, the proposed facility will require numerous cells arranged in multiples/arrays which will be fixed to a support structure.

### **Support Structure**

The photovoltaic (PV) modules will be mounted to steel support structures. These can either be mounted at a fixed tilt angle, optimised to receive the maximum amount of solar radiation and dependent on the latitude of the proposed facility, or a tracking mechanism where at a maximum tilt angle of  $45^\circ$  the modules would be approximately 0.3m off the ground.



**Figure 3:** Support structures

### **Fixed Mounted PV System**

In a fixed mounted PV system, PV panels are installed at a pre-determined angle from which they will not move during the lifetime of the plant's operation. The limitations imposed on this system due to its static placement are offset by the fact that the PV panels are able to absorb incident radiation reflected from surrounding objects. In addition, the misalignment of the angle of PV panels has been shown to only



marginally affect the efficiency of energy collection. There are further advantages which are gained from fixed mounted systems, including:

- » The maintenance and installation costs of a fixed mounted PV system are lower than that of a tracking system, which is mechanically more complex given that these PV mountings include moving parts.
- » Fixed mounted PV systems are an established technology with a proven track record in terms of reliable functioning. In addition, replacement parts are able to be sourced more economically and with greater ease than with alternative systems.
- » Fixed mounted systems are robustly designed and able to withstand greater exposure to winds than tracking systems.

### **Single Axis Tracking System**

A 'single axis tracker' will track the sun from east to west, while a dual axis tracker will in addition be equipped to account for the seasonal waning of the sun. These systems utilise moving parts and complex technology, including solar irradiation sensors to optimise the exposure of PV panels to sunlight. Tracking systems are a new technology and, as such, are less suitable to operations in South Africa. This is because:

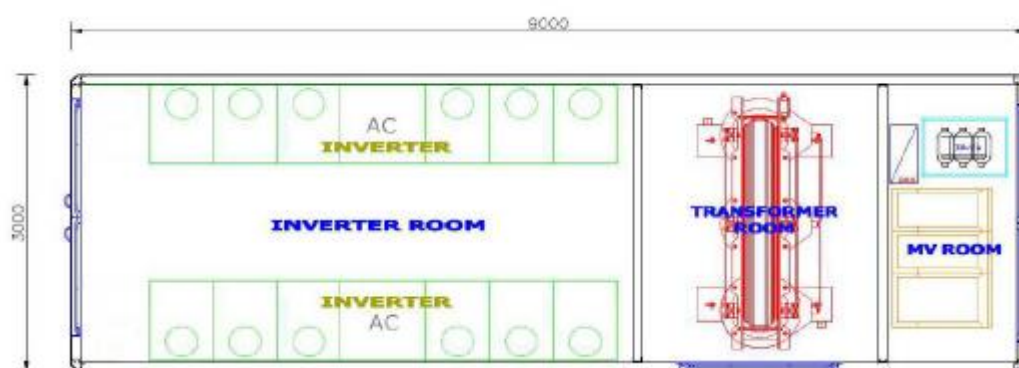
- » A high degree of maintenance is required due to the nature of the machinery used in the system, which consists of numerous components and moving parts. A qualified technician is required to carry out regular servicing of these parts, which places a question on the feasibility of this system given the remote location of the proposed project site.
- » The costs of the system are necessarily higher than a fixed mounted system due to the maintenance required for its upkeep and its complex design.
- » A larger project site is required for this system given that the separate mountings need to be placed a distance apart to allow for their tracking movement.
- » A power source is needed to mechanically drive the tracking system and this would offset a certain portion of the net energy produced by the plant.

Tracking panels are being considered for the proposed solar energy facility and will be up to 4m in height. The preferred technological option will be informed by financial, technical and environmental factors.

### **Inverter**

The photovoltaic effect produces electricity in direct current (DC). Therefore an inverter must be used to change it to alternating current (AC) for transmission in the national grid. The inverters convert the DC electric input into AC electric output, and then a transformer steps up the current to 33 kV for on-site transmission of the power. The inverter and transformer are housed at the power conversion station (PCS). The PV

combining switchgear (PVCS), which are dispersed among the arrays, collects the power from the arrays for transmission to the project's Substation. The inverters that Bluewave intend to use on the project are shown below and have a footprint of 9 by 3 meters and are typically 3 meters high. These are usually bolted to a concrete pad similar in size to the inverter.



**Figure 4:** Inverter schematic diagram (courtesy of Bonfiglioli SA)



**Figure 5:** Inverter (Photo courtesy of BlueWave Capital SA)

## 2. Overview of the Construction Phase

The 5 MW solar energy facility could take approximately 6 - 10 months to construct and commission, and would require the expertise of skilled, semi-skilled and low skilled staff.

In order to construct the proposed PV solar energy facility and associated infrastructure, a series of activities will need to be undertaken. Site preparation activities will include clearance of vegetation at the footprint of certain components (i.e. inverters and transformer position) and the establishment of the internal access roads. The PV panels will be sited a certain distance away from each other (to avoid

shading) within the broader development site. Clearing activities, where required, will involve the stripping of topsoil which will need to be stockpiled and/or spread on site. Anticipated activities during construction are described below.

### **Conduct Surveys**

Prior to initiating construction, a number of surveys will be required including, but not limited to, a geotechnical survey, a site survey and, survey of Substation site and access road servitudes.

### **Establishment of Access Roads**

Internal access roads of up to 7m in width will be required. An existing farm gravel road branching off the R377 (between Stella and Piet Plessis) will be upgraded and utilised to access the site.

### **Undertake Site Preparation**

Site preparation activities will include clearance of vegetation at the footprint of each support structure. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site.

### **Transport of Components and Equipment to Site**

The components and equipment required for the construction of the proposed facility will be brought to site in sections by means of national and provincial roads and then via the existing internal access road. Some of the components (i.e. transformer) may be defined as abnormal loads in terms of the Road Traffic Act (Act No. 29 of 1989) by virtue of the dimensional limitations (i.e. weight).

Typical civil engineering construction equipment will need to be brought to the site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the upgrade of the Substation and site preparation.

### **Establishment of Laydown Areas on Site**

Laydown and storage areas will be required for the typical construction equipment which will be required on site.

### **Erect PV Cells and Construct Substation & Inverters**

The PV cells will be arranged in arrays. The support structures will be fixed into the ground with the use of concrete, depending on the soil conditions at the site. The PV panel structure will be up to 4m in height.

An overhead power line approximately 950m (two route alternatives) in length to tie into the existing Edwardsdam 88/22kV Substation located within the farm boundaries and to the east of the R377 will be required to be constructed.

Inverters and PV plant transformer /Substation will be installed to facilitate the connection between the solar energy facility and the Eskom electricity grid. The position of the inverters within the footprint of the broader site will be informed by the final positioning of the PV components.

#### **Establishment of Ancillary Infrastructure**

Ancillary infrastructure may include a workshop, storage areas as well as a temporary contractor's equipment camp. The establishment of these facilities/buildings will require the clearing of vegetation and levelling of the development site and the excavation of foundations prior to construction. A laydown area for building materials and equipment associated with these buildings will also be required. Water storage tanks will also be placed on-site to collect water for cleaning of the PV panels.

#### **Undertake Site Rehabilitation**

Once construction is completed and once all construction equipment is removed from site, the site must be rehabilitated where practical and reasonable. On full commissioning of the facility, any access points to the site which are not required during the operational phase must be closed and rehabilitated.

### **3. Overview of the Operation Phase**

The electricity that is generated from the PV panels will be stepped up through the on-site inverters and transformers at the Substation. Thereafter energy will be transmitted via the 33kV overhead power line of approximately 1800m in length into the Edwardsdam 88/22kV Substation.

It is anticipated that full-time security, maintenance and control room staff will be required on site. Each component within the solar energy facility will be operational except under circumstances of mechanical breakdown, unfavourable weather conditions or maintenance activities.

#### **Cleaning of the PV Panels Using Water**

Two panel cleaning events per year are estimated which should accommodate dust storm events and regular cleaning. For operations, approximately 500,000 litres (or 500 m<sup>3</sup>) of water per annum is proposed to be trucked in from the nearest water source as per a water purchase agreement from a local authorised user or service provider.

### **4. Overview of the Decommissioning Phase**

The solar energy facility is expected to have a lifespan of more than 20 years (with maintenance) and the power plant infrastructure would only be decommissioned once it has reached the end of its economic life. If economically feasible/desirable the decommissioning activities would comprise the disassembly and replacement of the

individual components with more appropriate technology or infrastructure available at that time. However, if not deemed so, then the facility would be completely decommissioned which would include the following decommissioning activities.

**Site Preparation**

Site preparation activities will include confirming the integrity of the access to the site to accommodate the required equipment (e.g. lay down areas) and the mobilisation of decommissioning equipment.

**Disassemble and Remove Components**

All above ground facilities that are not intended for future use at the site would be disassembled, and reused and recycled (where possible), or disposed of in accordance with regulatory requirements. Much of the above ground wire, steel, and PV panels of which the system is comprised are recyclable materials and would be recycled to the extent feasible. The components of the plant would be deconstructed and recycled or disposed of in accordance with regulatory requirements. The site will be rehabilitated and can be returned to the current or other beneficial land-use.

**Provide a detailed description of the listed activities associated with the project as applied for**

The following listed activities have been applied for:

Notice Number	Activity	Description	Relevance of Regulation to Project
GN 544, 18 June 2010	Activity 1(ii):	The construction of facilities or infrastructure for the generation of electricity where; ii. the electricity output is 10 megawatts or less but the total extend of the facility is covers an area in excess of 1 hectare	The proposed 5MW PV facility would be less than 10MW in capacity but will cover an area of approximately 15 hectares in extent
GN 544, 18 June 2010	Item 10(i):	The construction of facilities or infrastructure for the transmission and distribution of electricity – (i)outside urban areas or industrial c	The project will require the construction of a new overhead power line (outside an urban area) to feed into to the existing Edwardsdam 88/22kV Substation. Two power line alternatives have been assessed in this report to be either parallel to an existing farm road or an existing power line.
GN 544, 18 June 2010	Activity 11	The Construction of: x. buildings exceeding 50 square metres in size; or xi. infrastructure or structure	The proposed PV facility will be situated a minimum distance of 150m from a non-perennial watercourse (Disipi). The

		covering 50 square metres or more Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	overhead power line will need to cross this watercourse to feed into the Edwardsdam Substation either parallel to an existing farm road or an existing power line.
GN 544, 18 June 2010	Activity 23(ii)	The transformation of undeveloped, vacant or derelict land to- ii residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.	The site is outside urban areas, and the proposed facility will have a development footprint of more than 1 hectare but less than 20 hectares. The final development footprint will be approximately 15 hectares.
GN 546, 18 June 2010	Activity 4	The construction of a road wider than 4m with a reserve less than 13,5m, outside urban areas in critical biodiversity areas identified in systematic biodiversity plans	The proposed solar energy facility will require the construction of internal roads wider than 4m located within a Terrestrial Critical Biodiversity Area (Tier 2) as mapped as part of the North-West Province Biodiversity Conservation Assessment (Skowno & Desmet 2008).
GN 546, 18 June 2010	Activity 12(b)	The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation (b) Within critical biodiversity areas identified in bioregional plans	The proposed solar energy facility is situated in a Critical Biodiversity Area, the construction of which may result in the clearance of 300 m <sup>2</sup> or more of indigenous vegetation where 75% of which constitutes indigenous vegetation.
GN 546, 18 June 2010	Activity 13(2)(a)	The clearance of vegetation of an area of 1 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation (a)In Critical Biodiversity Areas and Ecological Support Areas identified in regional	The proposed solar energy facility occurs within a Critical Biodiversity Area and may require the clearance of vegetative cover which may be more than 75% indigenous
GN 546, 18 June 2010	Activity 14(a)(i)	The clearance of an area of 5 hectares or more of vegetation, where 75% or more of the vegetative cover constitutes indigenous vegetation. (a) North West	The solar energy facility will be located outside urban areas and may require the clearance of more than 75% of indigenous vegetative cover.

i. All areas outside urban areas

The following listed activities were applied for but are no longer applicable based on the findings of this Basic Assessment Report:

Notice Number	Activity	Description	Reasons for exclusion
GN 546, 18 June 2010	Activity 12(b)	The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation (b) Within critical biodiversity areas identified in bioregional plans	The proposed solar energy facility is situated in a Critical Biodiversity Area (Tier 2) however the land use where the PV facility is proposed to be located has been altered from natural to agricultural use. No clearance of vegetation (of which 75% is indigenous) will therefore occur based on the results of the ecological assessment undertaken.
GN 546, 18 June 2010	Activity 13(2)(a)	The clearance of vegetation of an area of 1 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation (a) In Critical Biodiversity Areas and Ecological Support Areas identified in regional	The proposed solar energy facility is situated in a Critical Biodiversity Area (Tier 2) however the land use where the PV facility is proposed to be located has been altered from natural to agricultural use. No clearance of vegetation (of which 75% is indigenous) will therefore occur based on the results of the ecological assessment undertaken.
GN 546, 18 June 2010	Activity 14(a)(i)	The clearance of an area of 5 hectares or more of vegetation, where 75% or more of the vegetative cover constitutes indigenous vegetation. (b) North West i. All areas outside urban areas	It has been determined through the ecological specialist study that despite the location of the site outside an urban area that the vegetation cover is not indigenous as the proposed PV site is used for agricultural purposes.

## 2. FEASIBLE AND REASONABLE ALTERNATIVES

**"alternatives"**, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;

- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Regulation 22(2)(h) of GN R.543. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

#### **a) Site alternatives**

A site alternative refers to the identification of more than one potential site which may be suitable for the establishment of a proposed facility. Due to the nature of the proposed development (i.e. a renewable energy facility), the location of the project is largely dependent on technical and environmental factors such as solar irradiation (i.e. the fuel source), climatic conditions, available extent and the relief/topography of the site, and available grid connection.

The following characteristics were considered in determining the feasibility of the proposed site:

**Site Screening** - An environmental screening study commissioned by Bluewave Capital served to identify areas within the farm boundary or larger site which were more suited and unsuitable for the siting of a 5MW PV facility. The 5MW PV facility could potentially be sited in closer proximity to the Edwardsdam Substation. This option is however



constrained by the vegetation type (Mafikeng Bushveld) which is classified as Vulnerable close to the Edwardsdam Substation and has been determined to be of high sensitivity from an ecological perspective. Similarly the portion of the site where the PV area is proposed falls within a CBA (Tier 2), however this area has been ploughed and cultivated and no longer contains natural vegetation representative of the region.

**Site Extent** - space is an important factor for the development of a PV facility. An area of approximately 19.5 ha would be required for the 5MW facility (includes laydown areas during construction). The final footprint of the facility and associated infrastructure would be in the region of 16ha in extent. The site of the proposed 5MW facility therefore allows for the avoidance of any identified environmental and/or technical constraints in terms of the final design of the facility.

**Land availability and Site access** - The land for development of the 5MW PV facility is privately owned land available for lease by the developer. The identified site is accessible directly via a farm road branching off the R377 from and is therefore appropriately located to facilitate the transport of components and equipment as well as labour movement to and from the site.

**Climatic Conditions** - the economic viability of a PV facility is directly dependent on the annual direct solar irradiation values. The site has been demarcated as an area of high irradiation, which indicates that the regional location of the project is appropriate for a solar energy facility.

**Gradient** - a level surface area is preferred for the installation of PV panels (i.e. a gradient of 3% or less). The gradient of the site is flat, and no significant slopes or ridges are present within the study area which reduces the need for extensive earthworks and associated levelling activities, thereby minimising environmental impacts.


**Grid Capacity and Connection** - Eskom is constructing a 400kV line into Vryburg. There are some plans to build a substation between Stella and Edwardsdam but these plans still need to be finalized. Edwardsdam Substation currently has a single 88kV power line that feeds it as well as a new 132kV line is running from Vryburg. This 88kV power line is very long and incurs significant losses. Edwardsdam Substation feeds all the power in a ~60km radius and there has been some significant population growth in the nearby vicinity. Furthermore there are many farms with irrigation pumps that source their power from the Edwardsdam Substation.

The above factors have placed a significant burden on the Edwardsdam Substation capacity. Eskom has recently installed a new 88/22 kV transformer at the substation to mitigate some of the problems, however it is clear that the capacity constraint lies with the 88kV power line. This is the main reason Eskom is bolstering the capacity at the substation with the 132kV line. A 5MW solar PV electricity generating facility feeding

directly into the 22kV busbar at the Edwardsdam Substation will alleviate a significant portion of the capacity burden at the Substation. Furthermore this generation facility will ensure grid stability as these remote portions of the country, with their capacity constraints, are usually the worst affected by brown and blackouts.

Due to the proposed size and location of the facility, a 33kV connection to the Edwardsdam Substation is the preferred option. A connection application has been made to Eskom.

The proposed Stella Helpmekaar 5MW PV facility is expected to have a development footprint of approximately 16ha within the larger farm portion which is approximately 900ha in extent.

<b>Site Alternative 1</b>		
<p><b>Description of PV area:</b> The proposed Stella Helpmekaar 5MW PV facility is expected to have a development footprint of approximately 16ha within the larger farm portion which is approximately 900ha in extent. The 5MW PV facility is proposed to occupy an area of the greater farm portion to the west of the R377 and approximately 700m west of the Edwardsdam Substation on an area of the farm currently utilised for dryland crop farming. This area was identified as being the most ecologically suitable option at the project screening phase due to the extent of transformation of the natural vegetation from current land use practices and no site alternatives for the 5MW PV area are provided for assessment.</p>	<p>Lat 26° 16' 08" S</p>	<p>Long 24° 34' 09" E</p>
		

<p>ACCESS ROAD TO EXISTING ROAD</p> <p>PERMANENT SECURITY BUILDING AREA: 1,000 SQUARE METERS</p> <p>PERMANENT AYDOWN AREA: 1,000 SQUARE METERS</p> <p>POTENTIAL BORROW PITS AREA: 1,000 SQUARE METERS</p> <p>TEMPORARY CONSTRUCTION AYDOWN AREA: 10,000 SQUARE METERS</p> <p>TEMPORARY SPOIL HEAPS AREA: 1,000 SQUARE METERS</p> <p>R377</p> <p>ELECTRIC DISTRIBUTION LINE (950m): OVERHEAD</p> <p>7m WIDE PERIMETER ACCESS ROAD: WIDTH TO REMAIN FOR LIFE OF PROJECT</p> <p>INVERTER PAD (TYP): 50 SQUARE METER CONCRETE FOUNDATION</p> <p>ELECTRIC DISTRIBUTION LINE (850m): BURIED IN TRENCH (DIMENSIONS TO BE SPECIFIED BY ELECTRICAL ENGINEER)</p> <p>SINGLE AXIS TRACKER: 60 MODULES: FS-390 THIN FILM (TYP)</p> <p>SOLAR PERIMETER FENCE ENCLOSING PERMANENT ASPECTS OF PROJECT: 160,000 SQUARE METERS</p> <p>APPROXIMATION OF SAVANNAH SURVEYED STREAM</p>		
<p><b>Figure 6: General character of the identified site showing farmstead in background and footprint of proposed PV facility</b></p>		
<p style="text-align: center;"><b>Alternative 2</b></p>		
<p style="text-align: center;"><b>Alternative 3</b></p>		
<p style="text-align: center;"><b>Alternative 4</b></p>		

In the case of linear activities:

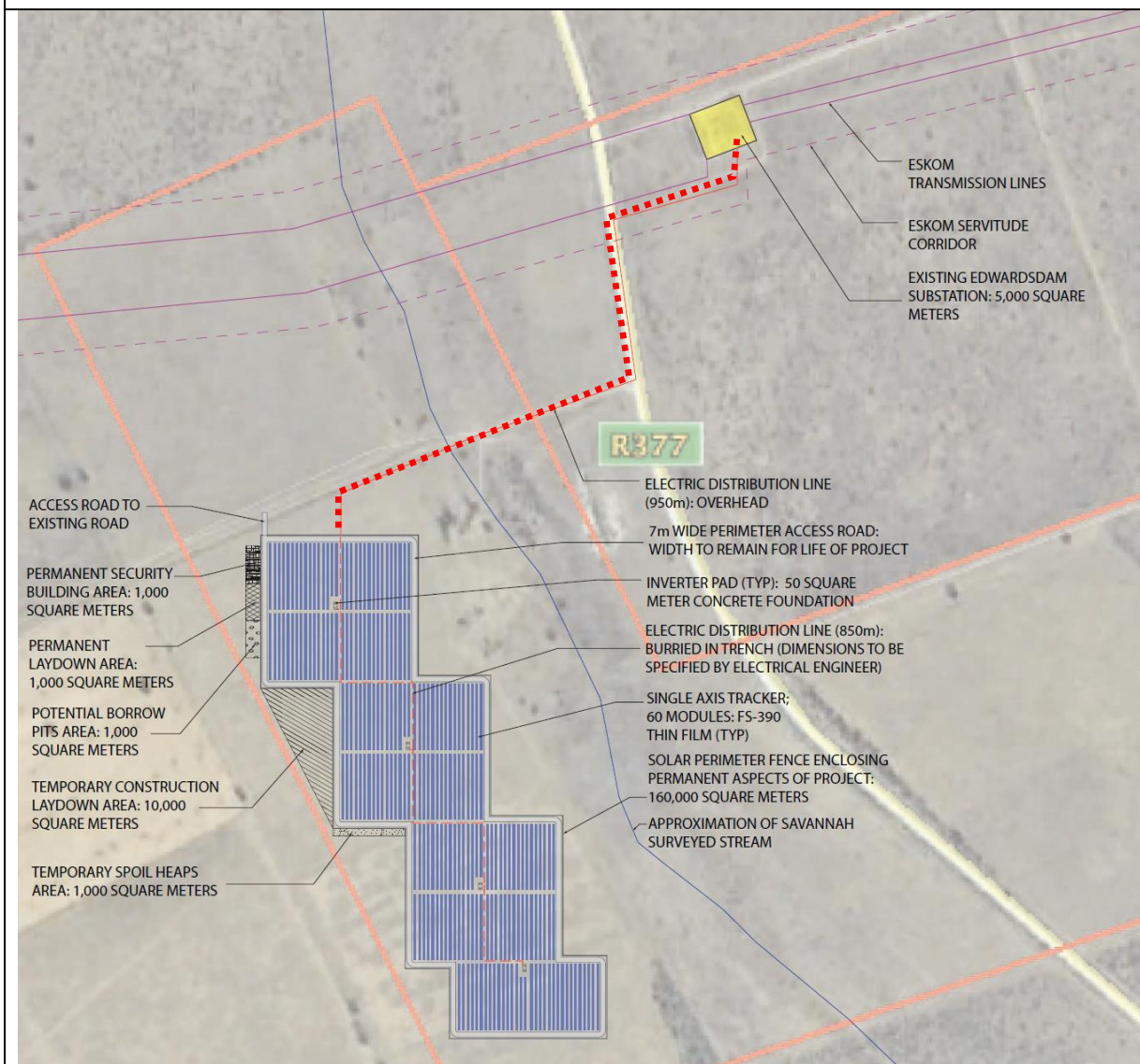
Two power line route alternatives are included for the PV facility, with existing road and electrical infrastructure on the greater farm portion presenting opportunities for aligning the proposed linear infrastructure with existing linear infrastructure to minimise the potential impacts. The co-ordinates for the power line of suitable voltage to connect into the existing Edwardsdam Substation are provided below:

**Power Line Route Alternative 1**

**Power line parallel to existing roads to connect to Edwardsdam Substation (~950m)**

	<b>Latitude (S):</b>			<b>Longitude (E):</b>		
• Starting point of the activity	26°	16'	12.63"	24°	34'	06.86"
• Middle/Additional point of the activity	26°	15'	42.66"	24°	33'	58.47"
• End point of the activity	26°	15'	35.66"	24°	34'	17.77"

Power Line Route Alternative 1 will originate at the northern PV array and turn to the east before intercepting the existing farm access road. The power line will then turn to the north and run parallel to the R377 before moving east at the Eskom distribution line before turning north to feed into the Edwardsdam Substation. This route alternative will be approximately 950m in length.



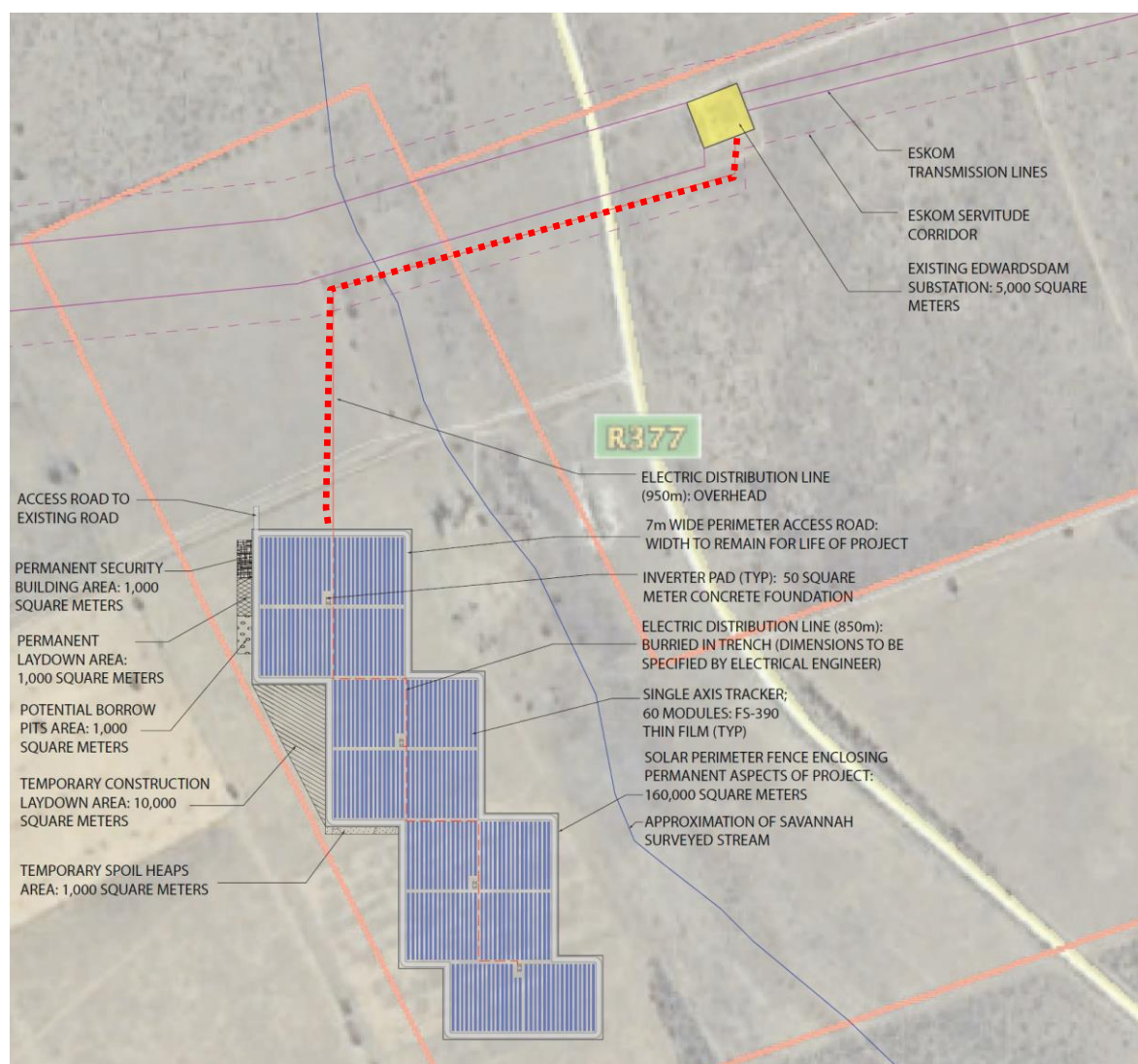
**Figure 7: 5MW PV footprint west of the R377 indicating power line Route Alternative 1 (red dotted line) running parallel to existing roads**

**Power Line Route Alternative 2**

**Route Alternative 2 - Power line parallel to an existing Eskom power line to connect to Edwardsdam Substation (~950m)**

	Latitude (S):			Longitude (E):		
• Starting point of the activity	26°	15'	53.19"	24°	33'	59.04"
• Middle/Additional point of the activity	26°	15'	45.61"	24°	34'	12.85"
• End point of the activity	26°	15'	35.66"	24°	34'	17.77"

Power Line Route Alternative 2 will originate at the northern point of the PV array and cross the existing farm access road. The line will then intercept the existing power line and run for approximately 560m to the east parallel to the existing power lines before turning north to connect to the Edwardsdam Substation. This route alternative will also be approximately 950m in length.



**Figure 8: 5MW PV footprint west of the R377 indicating power line Route Alternative 2 (red dotted line) running northwards then eastwards parallel to existing power lines**

Alternative S3 (if any)

• Starting point of the activity					
• Middle/Additional point of the activity					
• End point of the activity					

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

**b) Layout alternatives**

<b>Alternative 1 (preferred alternative)</b>		
<b>Description:</b>	<b>Lat (DDMMSS)</b>	<b>Long (DDMMSS)</b>
The proposed Stella Helpmekaar Solar Energy Facility is expected to have a development operational footprint of ~16ha.  Contiguous rectangular shapes are easier to construct. However, the constraints of the land parcel required several smaller rectangles in order to conform to the farm boundary and the non-perennial watercourse (Disipi) running between the proposed PV site and the R377. No layout alternatives are provided for assessment.	26° 16' 08" S	24° 34' 09" E
<b>Alternative 2</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)
<b>Alternative 3</b>		
Description	Lat (DDMMSS)	Long (DDMMSS)

**c) Technology alternatives**

<b>Alternative 1 (preferred alternative)</b>
<p>As it is the intention of Bluewave Capital to develop renewable energy projects as part of the DoE's Small-scale (i.e. ≤5MW) Renewable Energy Independent Power Procurement (REIPPP) Programme, only renewable energy technologies are being considered. Solar energy is considered to be the most suitable renewable energy technology for this site, based on the site location, ambient conditions and energy resource availability (i.e. solar irradiation). PV technology is considered more feasible from a technical perspective at this scale of development (i.e. a small scale project). Furthermore, PV does not require large volumes of water power generation purposes.</p> <p>The selection of available PV technologies is usually differentiated by weather and temperature conditions that prevail, such that optimality is obtained by the final choice. The impacts of any of the PV technology choices on the environment are very similar and differentiated by different landscapes and technologies. The construction, operation and decommissioning activities associated with the facility will also be the same irrespective of the technology chosen. There are a number of different solar PV technologies, i.e.:</p> <ul style="list-style-type: none"> <li>» Fixed / static PV panels;</li> <li>» Tracking PV panels (with solar panels that rotate to follow the sun's movement).</li> </ul> <p>Single-axis tracking PV is being considered for the proposed facility. The preferred option will be informed by financial, technical and environmental factors. No technology alternatives are considered further.</p>
<b>Alternative 2</b>
<b>Alternative 3</b>

**d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)**

<b>Alternative 1 (preferred alternative)</b>
<p><b><i>Operating Alternatives</i></b></p> <p>This refers to the manner in which a proposed facility would function. For example, should a wind energy facility prove problematic for avifauna during migrating periods, an operating alternative of switching off certain turbines during those times could be proposed. No operating alternatives would be applicable to the proposed solar energy facility as there are no feasible means of alternative operation for a facility of this nature. No operating alternatives are considered further.</p>
Alternative 2
Alternative 3



**e) No-go alternative**

This is the option of not constructing the Stella Helpmekaar Solar Energy Facility. This option is assessed as the “no go alternative” in this Basic Assessment Report (Section D and Appendix F), against which the project impacts are assessed. If the project does not proceed, there will still be a need for alternative energy projects to supplement the current power requirements of the country. The site will remain unchanged and there will be no opportunities for temporary and permanent employment created through this project.

**Paragraphs 3 – 13 below should be completed for each alternative.**

### 3. PHYSICAL SIZE OF THE ACTIVITY

**a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):**

**Alternative:**

Alternative A1<sup>1</sup> (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

**Size of the activity:**

PV facility ~160 000 m <sup>2</sup>
m <sup>2</sup>
m <sup>2</sup>

or, for linear activities:

**Alternative:**

Alternative A1 (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

**Length of the activity:**

Adjacent to existing roads = 950 m
Adjacent to existing power line = 950 m
m

**b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):**

**Alternative:**

PV facility site

Alternative A1  
(preferred route alternative)

Alternative A2  
(alternative route)

Alternative A3 (if any)

**Size of the site/servitude:**

Approximately 195 000m <sup>2</sup>
20 900 m <sup>2</sup> (22m X 950m)
20 900 m <sup>2</sup> (22m X 950m)
m <sup>2</sup>

### 4. SITE ACCESS

Does ready access to the site exist?

If NO, what is the distance over which a new access road will be built

<b>YES</b> ✓	
	m

Describe the type of access road planned:

<sup>1</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

The site is accessible via a farm road branching off the R377 between Piet Plessis and Stella. A short access road of approximately 40m in length will be required to be constructed from this existing farm road at a point approximately 550m from the R377 to access the 5MW PV facility.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site. See Appendix A.

A site plan showing the position of the access road, as well as an indication of the road in relation to the site is included within **Appendix A**.

## 5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as **Appendix A**. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

An A3 Locality Map is attached within **Appendix A**.

## 6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as **Appendix A** to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

A detailed site plan(s) for each alternative activity is attached within **Appendix A**

## **7. SENSITIVITY MAP**

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in **Appendix A**.

A sensitivity map covering areas within 100m of the site is attached within **Appendix A**.

## **8. SITE PHOTOGRAPHS**

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under **Appendix B** to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

Colour photographs have been taken from the centre of the proposed site in the eight major compass directions. Annotated photographs are included in **Appendix B**.

## 9. FACILITY ILLUSTRATION

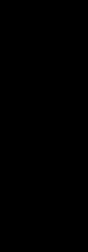


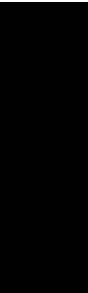
A detailed illustration of the activity must be provided at a scale of at least 1:200 as **Appendix C** for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

A preliminary facility illustration which represents a realistic image of the planned solar energy facility is attached within **Appendix C**.

## 10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

<b>1. Is the activity permitted in terms of the property's existing land use rights?</b>	NO ✓	Please explain
The proposed development site is currently zoned for agricultural use. The development footprint or site will be required to be rezoned to 'special use' as required by the Municipality.		
<b>2. Will the activity be in line with the following?</b>		
<b>(a) Provincial Spatial Development Framework (PSDF)</b>	YES ✓	Please explain
The Renewable Energy Strategy (RES) for the North West Province (2012) was developed by North West Department of Economic Development, Environment, Conservation and Tourism (DEDECT) to enable the Province to participate competitively within the emerging renewable energy sector of South Africa, while addressing the Province's contribution to greenhouse gas emissions and the use of non-renewable fossil fuel resources. Various renewable energy source options were investigated in the RES. Solar (photovoltaic as well as solar water heaters), municipal solid waste, hydrogen and fuel cell technologies, biomass, and energy efficiency were identified as sub-sectors/sources which hold the greatest competitive potential in the Province. Therefore, the project can contribute positively to the RES for the North West Province.		
<b>(b) Urban edge / Edge of Built environment for the area</b>	YES ✓	Please explain
The proposed site far removed from urban areas the nearest being the town of Piet Plessis which is located approximately 22 km from the site and Stella located approximately 44km from the site. The development will therefore not impact on an urban edge.		

<p><b>(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).</b></p>	<p><b>Yes</b> ✓</p>		<p>Please explain</p>
<p>In terms of the Integrated Development Plan adopted by the Dr Ruth Segomotsi Mompati District Municipality (2007 – 2011), the site falls within the south-eastern periphery of a cattle/game farming node and indicates that investment that economic activity should be focussed on these areas. The project will not however compromise the integrity of the IDP.</p> <p>The solar facility will also create direct and indirect job opportunities that will stimulate local economic growth. The project will not compromise the integrity of the IDP.</p>			
<p><b>(d) Approved Structure Plan of the Municipality</b></p>	<p><b>YES</b> ✓</p>		<p>Please explain</p>
<p>One of the municipality’s objectives is to upgrade bulk electricity networks and associated infrastructure. This project will assist with the upgrading of this infrastructure and creating jobs.</p>			
<p><b>(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)</b></p>		<p>NO ✓</p>	<p>Please explain</p>
<p>Dr Ruth Segomotsi Mompati District Municipality does not have an Environmental Management Framework as a development guiding tool in its jurisdiction. The Dr Ruth Segomotsi Mompati District IDP identifies threatened and vulnerable areas and other areas of conservation concern as described in the North West Province Biodiversity Conservation Assessment. None of the sensitive areas within the District occur in the study area. The majority of the District is ascribed a “not currently threatened status”.</p>			
<p><b>(f) Any other Plans (e.g. Guide Plan)</b></p>	<p><b>YES</b></p>	<p><b>NO</b></p>	<p>Please explain</p>
<p>N/A</p>			
<p><b>3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?</b></p>	<p><b>YES</b> ✓</p>		<p>Please explain</p>
<p>The main purpose of the development is to generate electricity from a renewable</p>			

<p>resource, which will be fed into the national grid. The project is not specifically considered within the approved municipal SDF. However the municipality identified basic service delivery such as electricity, creation and economic growth as priorities within the SDF both locally and within the district municipality. The proposed development will assist in achieving these objectives</p>		
<p><b>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</b></p>	<p>YES ✓</p>	<p>Please explain</p>
<p>Eskom is constructing a 400kV line into Vryburg. There are some plans to build a substation between Stella and Edwardsdam but these plans still need to be finalized. Edwardsdam Substation currently has a single 88kV power line that feeds it as well as a new 132kV line is running from Vryburg. This 88kV power line is very long and incurs significant losses. Edwardsdam Substation feeds all the power in a ~60km radius and there has been some significant population growth in the nearby vicinity. Furthermore there are many farms with irrigation pumps that source their power from the Edwardsdam Substation.</p> <p>The above factors have placed a significant burden on the Edwardsdam Substation capacity. Eskom has recently installed a new 88/22 kV transformer at the substation to mitigate some of the problems, however it is clear that the capacity constraint lies with the 88kV power line. This is the main reason Eskom is bolstering the capacity at the substation with the 132kV line. A 5MW solar PV electricity generating facility feeding directly into the 22kV busbar at the Edwardsdam Substation will alleviate a significant portion of the capacity burden at the Substation. Furthermore this generation facility will ensure grid stability as these remote portions of the country, with their capacity constraints, are usually the worst affected by brown and blackouts.</p> <p>The proposed development will benefit the local community through job creation, skills development opportunities and training which will, in turn, assist in reducing poverty levels that the area is currently facing, and strengthen electricity supply for the area.</p>		
<p><b>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</b></p>	<p>YES ✓</p>	<p>Please explain</p>
<p>All the services required for the project have been adequately provided for and, should any need for other services arise, the relevant authority will be communicated with.</p>		

<p><b>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</b></p>		<p><b>NO</b> ✓</p>	<p>Please explain</p>
<p>The proposed project is to be developed by a private developer (i.e. Bluewave Capital) and not the municipality. It therefore does not fall within the infrastructure planning of the municipality. The project will not have any implications for the infrastructure planning of the municipality. This is explained below:                  Roads: Access provision from the R377 may result in localised road impacts but the cost of any access provisions or upgrades will be absorbed by the applicant.                  Water: The municipality will provide the applicant with confirmation of the availability of water.                  Electricity: The development will generate power, and will strength the local electricity supply as the electricity generated will be fed directly into the Eskom grid.</p>			
<p><b>7. Is this project part of a national programme to address an issue of national concern or importance?</b></p>		<p><b>YES</b> ✓</p>	<p>Please explain</p>
<p>This project is proposed to be developed under the Department of Energy REIPPP Programme. The evacuation of additional power into the Eskom grid will serve to improve the stability of the grid for the immediate area, assist the government in achieving the goal of 17GW renewable energy as part of the electricity generation technology mix by 2030, and assist in the reduction in the need to mine non-renewable resources such as coal for conventional power generation. In order to meet the long-term goal of a sustainable renewable energy industry, a target of 17.8GW of renewables by 2030 has been set by the Department of Energy (DoE) within the Integrated Resource Plan (IRP) 2010 and incorporated in the REIPPP Programme. This energy will be produced from various renewable energy technologies including solar energy facilities (such as PV technology). The proposed project is to contribute towards this goal for renewable energy and is identified as a Strategic Infrastructure Project in terms of the South African National Infrastructure Plan.</p>			
<p><b>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</b></p>		<p><b>YES</b> ✓</p>	<p>Please explain</p>
<p>» <i>Site access</i>                  The identified site is accessible via an existing farm road off of the R377 between Piet Plessis and Stella.                  » <i>Climatic Conditions</i>                  The economic viability of a photovoltaic plant is directly dependent on the annual</p>			



<p>direct solar irradiation values. A study of available radiation data shows that the proposed site is uniformly irradiated by the sun.</p> <p>» <i>Gradient</i>                  A level surface area is preferred for the installation of PV panels and specifically for PV technologies. This reduces the need for extensive earthworks associated with the levelling of a site, thereby minimising environmental impacts. The proposed area for the proposed PV plant is generally on a flat location with slopes less than 5 degrees.</p> <p>» <i>Grid Connection</i>                  Due to the proposed size and location of the facility, an overhead power line (33kV) of approximately 1800m in length will be required to feed into the existing Edwardsdam Substation on site. A connection application has been made to Eskom.</p>		
<b>9. Is the development the best practicable environmental option for this land/site?</b>	<b>YES</b> ✓	Please explain
<p><b>Electrical infrastructure:</b> The Edwardsdam Substation is located within 700m of the proposed site within the greater farm portion, which is relevant for this development. The greater farm portion is characterised by two overhead transmission lines running in an east-west direction and is therefore already characterised by linear disturbances and electrical infrastructure. The proposed development is in line with current land use on the site, and would therefore not significantly alter the sense of place.</p> <p><b>Access:</b> The site is easily accessed from existing major roads and no long access roads are required in order to connect to the proposed PV area.</p> <p><b>Environmental sensitivity:</b> Within the boundary of the affected farm portion, the proposed 5MW PV site is the best practicable environmental option as the land use in this section of the vegetation has been completely altered by previous agricultural land uses characterised by very sandy and dry conditions. Limited grazing on the site is possible. Other natural areas of the farm portion remain in an intact state and are of higher sensitivity than the cultivated sections of the site. Currently a PV energy facility is the best practicable environmental option as it will offer an additional income source to the landowner (who will earn a portion of the revenue from the facility), as well as an alternative, sustainable energy source, and at the same time reduce the carbon footprint and environmental impacts associated with coal-generated electricity,</p>		
<b>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</b>	<b>YES</b> ✓	Please explain
<p>The negative impacts associated with the proposed activity include impacts on vegetation, soils and land use and are expected to be limited to the development footprint, and are not considered to be of high significance. All impacts can be managed and mitigated to acceptable levels, as outlined in the Environmental Management Programme.</p>		

<p>Positive impacts associated with the facility include i) an alternative income source for the landowner; ii) generation of electricity from a renewable resource also reduces reliance (albeit limited) on conventional power sources; iii) local economic upliftment and job creation. These positive impacts will extend beyond the boundary of the site and are expected to outweigh the negative impacts.</p>			
<p><b>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</b></p>		<p><b>NO</b> ✓</p>	<p>Please explain</p>
<p>There are no known similar commercial solar energy facilities being applied for within the local municipality, however the existing power lines and a substation support the proposed siting of a PV facility in this location. No development precedent has been set which would see accumulation of similar power generation developments within a specific portion of the municipal area.</p>			
<p><b>12. Will any person's rights be negatively affected by the proposed activity/ies?</b></p>		<p><b>NO</b> ✓</p>	<p>Please explain</p>
<p>The proposed project will take place on privately owned land. The proposed facility would impact directly on the landowner and indirectly on adjacent landowners. It must be noted that the affected landowner would enter into a lease agreement with the developer and would be compensated for the use of his property. Therefore, his rights are not considered to be affected. Adjacent landowners and surrounding residents may be affected from a visual perspective (up to 3.5km from the PV facility). It is not expected that this would impact on their rights. Parties who might be interested in or affected by the construction of the facility are consulted with regards to the proposed project through the EIA process.</p>			
<p><b>13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?</b></p>		<p><b>NO</b> ✓</p>	<p>Please explain</p>
<p>The proposed site far removed from urban areas the nearest being the town of Piet Plessis which is located approximately 22 km from the site and Stella located approximately 44km from the site. The development will not impact on an urban edge.</p>			
<p><b>14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?</b></p>	<p><b>YES</b> ✓</p>		<p>Please explain</p>
<p>The proposed activity covers the objectives of Strategic Infrastructure Projects (SIPS) 8, 9 and 10:</p> <ul style="list-style-type: none"> <li>• SIP 8: Green energy of support of South African economy - Support sustainable green energy initiatives on a National scale through a diverse range of clean energy options envisaged in the Integrated Resource Plan(IRP 2010)</li> <li>• SIP 9: Electricity Generation to support socio-economic development: Accelerate construction of new electricity capacity in accordance with IRP 2010 to meet the need of the economy and address historical imbalance.</li> <li>• SIP 10: Electricity transmission and distribution for all - Expansion of the transmission and distribution network for all and support economic development.</li> </ul>			

<b>15. What will the benefits be to society in general and to the local communities?</b>	Please explain
Job opportunities, albeit limited, will be created during the construction and operation of the proposed facility. In addition, local and regional economic benefits would be realised through the additional revenue generated as a result of the proposed project (through direct and indirect job opportunities, local spend, local procurement, etc.).	
<b>16. Any other need and desirability considerations related to the proposed activity?</b>	Please explain
As indicated in the IDP, the area is in need of infrastructure which will benefit the municipal economy. This project will assist in addressing this need.	
<b>17. How does the project fit into the National Development Plan for 2030?</b>	Please explain
One of the National Development Plan for 2030 is the transition to low carbon energy through speeding up and expanding renewable energy. This project will fit into this vision since it aims to contribute towards electricity supply through carbon-free methods.	
<b>18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.</b>	
The general objectives of Integrated Environmental Management have been taken into account for this Basic Assessment Report by means of identifying, predicting and evaluating the actual and potential impacts on the environment, socio-economic conditions and cultural heritage component. The risks, consequences, alternatives as well as options for mitigation of activities have also been considered with a view to minimise negative impacts, maximise benefits, and promote compliance with the principles of environmental management.	
<b>19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.</b>	
<p>The principle of environmental management as set out in section of NEMA states that:</p> <ul style="list-style-type: none"> <li>» Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably;</li> <li>» Development must be sustainable socially (people), environmentally (planet) and economically (prosperity);and</li> <li>» Sustainable development requires the consideration of all the relevant factors,</li> </ul> <p>From project perspective the development can be considered sustainable as it makes use of renewable energy resource and does not have a high significant impact on the environment.</p> <p>These principles of sustainable development is further taken into account by including measures within the Environmental Management Programme (EMPr) to mitigate impacts that may occur thereby further reducing the environmental impacts. The</p>	

EMPr would provide mitigation measures in terms of disturbance to ecosystems, loss of biodiversity, pollution and degradation to the environment, waste and storm water management.

### **11.APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES**

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

**Table 1:** List all legislation, policies and/or guidelines for the Stella Helpmekaar Solar Energy Facility

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<b>National Legislation</b>			
<p>National Environmental Management Act (Act No 107 of 1998)</p>	<p>The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations.</p> <p>In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p> <p>In terms of GNR 544 - 546 of June 2010 a Scoping and EIA Process is required to be undertaken for the proposed project.</p>	<p>Department of Environmental Affairs – competent authority</p> <p>North West Department of Economic Development, Environment, Conservation and Tourism</p>	<p>The listed activities triggered by the proposed solar energy facility have been identified and assessed in the EIA process being undertaken (i.e. Scoping and EIA).</p> <p>This Basic Assessment Report will be submitted to the competent and commenting authority in support of the application for authorisation.</p>
<p>National Environmental Management Act (Act No 107 of 1998)</p>	<p>In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised.</p> <p>In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p>	<p>Department of Environmental Affairs</p>	<p>While no permitting or licensing requirements arise directly by virtue of the proposed project, this section has found application during the EIA Phase through the consideration of potential impacts (cumulative, direct, and indirect). It will continue to apply throughout the life cycle of the project.</p>
<p>Environment Conservation</p>	<p>National Noise Control Regulations (GN R154</p>	<p>Department of Environmental</p>	<p>Noise impacts are expected to be</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
Act (Act No 73 of 1989)	dated 10 January 1992)	Affairs  Department of Environment and Nature Conservation  Local Authorities	associated with the construction phase of the project and are not likely to present a significant intrusion to the local community. Therefore is no requirement for a noise permit in terms of the legislation.  On-site activities should be limited to 6:00am - 6:00pm, Monday - Saturday (excluding public holidays).  Should activities need to be undertaken outside of these times, the surrounding communities will need to be notified and appropriate approval will be obtained from DEA and the Local Municipality.
National Water Act (Act No 36 of 1998)	Water uses under S21 of the Act must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation.	Department of Water Affairs  Provincial Department of Water Affairs	A water use license (WUL) is required to be obtained if surface water features are to be impact on. The Disipi non-perennial river occurs on the site and will not be impacted by the proposed facility, however the power line (both alternatives) will be required to cross this watercourse.  Should water be abstracted from a borehole on site or any other natural resource for use within the facility, a water use license may be required.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Water Act (Act No 36 of 1998)	In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring.	Department of Water Affairs  Provincial Department of Water Affairs	This section of the Act will apply with respect to the potential impact on drainage lines, primarily during the construction phase (i.e. pollution from construction vehicles).
Minerals and Petroleum Resources Development Act (Act No 28 of 2002)	<p>A mining permit or mining right may be required where a mineral in question is to be mined (e.g. materials from a borrow pit) in accordance with the provisions of the Act. Requirements for Environmental Management Programmes and Environmental Management Plans are set out in S39 of the Act.</p> <p>S53 Department of Mineral Resources: Approval from the Department of Mineral Resources (DMR) may be required to use land surface contrary to the objects of the Act in terms of section 53 of the Mineral and Petroleum Resources Development Act, (Act No 28 of 2002): In terms of the Act approval from the Minister of Mineral Resources is required to ensure that proposed activities do not sterilise a mineral resources that might occur on site</p>	Department of Mineral Resources	<p>As no borrow pits are expected to be required for the construction of the facility, no mining permit or right is required to be obtained.</p> <p>A Section 53 application will be submitted the North West DMR office.</p>
National Environmental Management: Air Quality Act (Act No 39 of 2004)	<p>S18, S19, and S20 of the Act allow certain areas to be declared and managed as "priority areas."</p> <p>Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with</p>	Department of Environmental Affairs	<p>No permitting or licensing requirements arise from this legislation.</p> <p>The Act provides that an air quality officer may require any person to</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	relevant emission standards.		submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.
National Heritage Resources Act (Act No 25 of 1999)	<p>S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including:</p> <ul style="list-style-type: none"> <li>» The construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; and</li> <li>» Any development or other activity which will change the character of a site exceeding 5 000 m<sup>2</sup> in extent.</li> </ul> <p>Stand alone HIAs are not required where an EIA Process is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of S38. In such cases only those components not addressed by the EIA should be covered by the heritage component.</p>	South African Heritage Resources Agency	<p>A permit may be required should identified cultural/heritage sites on site be required to be disturbed or destroyed as a result of the proposed development.</p> <p>A HIA has been undertaken as part of the Basic Assessment Process to identify heritage sites. No heritage sites are located within the study area. See Appendix D2.</p>
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007.	Department of Environmental Affairs	<p>As the applicant will not carry out any restricted activity, as is defined in S1 of the Act, no permit is required to be obtained in this regard.</p> <p>Specialist flora and fauna studies have been undertaken as part of the basic Assessment process. As such the potential occurrence of critically</p>



Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase.</p> <p>The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GoN 1002), 9 December 2011).</p>		<p>endangered, endangered, vulnerable, and protected species, as well as critically endangered (CR), endangered (EN), vulnerable (VU) or protected ecosystems and the potential for them to be affected has been considered, this report is contained in Appendix D1.</p>
<p>Conservation of Agricultural Resources Act (Act No 43 of 1983)</p>	<p>Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048.</p>	<p>Department of Agriculture</p>	<p>This Act will find application throughout the life cycle of the project. In this regard, soil erosion</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>Weeds are described as Category 1 plants, while invader plants are described as Category 2 and Category 3 plants. These regulations provide that Category 1, 2 and 3 plants must not occur on land and that such plants must be controlled by the methods set out in Regulation 15E.</p>		<p>prevention and soil conservation strategies must be developed and implemented. In addition, a weed control and management plan must be implemented.</p> <p>The permission of agricultural authorities will be required if the Project requires the draining of vleis, marshes or water sponges on land outside urban areas.</p>
<p>National Forests Act (Act No. 84 of 1998)</p>	<ul style="list-style-type: none"> <li>» In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated”.</li> <li>» GN 1042 provides a list of protected tree species.</li> </ul>	<p>National Department of Forestry</p>	<p>A permit would need to be obtained for any protected trees that are affected by the development.</p>
<p>National Veld and Forest Fire Act (Act 101 of 1998)</p>	<p>In terms of S21 the applicant would be obliged to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land.</p> <p>In terms of S12 the applicant must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the</p>	<p>Department of Water Affairs</p>	<p>While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>fire from spreading, not causing erosion, and is reasonably free of inflammable material.</p> <p>In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires.</p>		
<p>Hazardous Substances Act (Act No 15 of 1973)</p>	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <p>Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance</p> <p>Group IV: any electronic product; and</p> <p>Group V: any radioactive material.</p> <p>The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license</p>	<p>Department of Health</p>	<p>It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license is required to be obtained from the Department of Health.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	being in force.		
Development Facilitation Act (Act No 67 of 1995)	Provides for the overall framework and administrative structures for planning throughout the Republic.  S(2 - 4) provide general principles for land development and conflict resolution.	Local Municipality  District Municipality	The applicant must submit a land development application in the prescribed manner and form as provided for in the Act. A land development applicant who wishes to establish a land development area must comply with procedures set out in the Act.
Subdivision of Agricultural Land Act (Act No 70 of 1970)	Details land subdivision requirements and procedures. Applies for subdivision of all agricultural land in the province	Local Municipality  District Municipality	Subdivision will have to be in place prior to any subdivision approval in terms of S24 and S17 of the Act.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The Minister may by notice in the <i>Gazette</i> publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.  The Minister may amend the list by –  » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list.  In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities.	National Department of Water and Environmental Affairs  Provincial Department of Environmental Affairs (general waste)	As no waste disposal site is to be associated with the proposed project, no permit is required in this regard.  Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMP (refer to Appendix G).  The volumes of waste to be generated and stored on the site during construction and operation of the facility will not require a waste license (provided these remain below the prescribed thresholds).  » in excess of 100m <sup>3</sup> of general

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> <li>» The containers in which any waste is stored, are intact and not corroded or in</li> <li>» any other way rendered unfit for the safe storage of waste.</li> <li>» Adequate measures are taken to prevent accidental spillage or leaking.</li> <li>» The waste cannot be blown away.</li> <li>» Nuisances such as odour, visual impacts and breeding of vectors do not arise; and</li> <li>» Pollution of the environment and harm to health are prevented.</li> </ul>		<p>waste</p> <ul style="list-style-type: none"> <li>» in excess of 35m<sup>3</sup> of hazardous waste</li> </ul>
<p>National Road Traffic Act (Act No 93 of 1996)</p>	<ul style="list-style-type: none"> <li>» The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</li> <li>» Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.</li> </ul>	<ul style="list-style-type: none"> <li>» South African National Roads Agency Limited (national roads)</li> <li>» Provincial Department of Transport</li> </ul>	<ul style="list-style-type: none"> <li>» An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads.</li> <li>» Transport vehicles exceeding the dimensional limitations (length) of 22m.</li> <li>» Depending on the trailer configuration and height when loaded, some of the substation components may not meet specified dimensional limitations</li> </ul>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	» The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.		(height and width).
National Dust Control Regulations (1 November 2013)	» The regulations prescribe general measures for the control of dust (settleable particulate matter) in all areas including restriction areas, residential and non-residential areas	» National DEA » Provincial authorities	» To prescribe general measures for the control of dust in all areas.
Provincial Legislation			
Transvaal Nature Conservation Ordinance, No. 12 of 1983 Note: The North West Biodiversity Conservation Bill was published for comments under Notice Nr. 394, Provincial Gazette 6719, dated 23 December 2009	Lists plant and animal species as protected	North West Department of Economic Development, Environment, Conservation and Tourism	Impacts on <i>Acacia erioloba</i> identified in the natural areas of the site is likely to be very low due to the position of the PV site on cultivated part of the site. No other listed or protected species were observed at the site and given the transformed nature of the development area, it is unlikely that any other such species are present or likely to be affected by the development.

## 12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

<b>YES</b> ✓	<input checked="" type="checkbox"/>
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If YES, what estimated quantity will be produced per month?

± 9m <sup>3</sup>
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Solid construction waste will consist mainly of vegetation, spoil material from clearing activities and metal and cabling off cuts – over 10 month period.

How will the construction solid waste be disposed of (describe)?

It is anticipated that construction waste will be disposed of at the nearest licensed municipal landfill site.

Where will the construction solid waste be disposed of (describe)?

In order to comply with legal requirements should there be excess solid construction waste after recycling options have been exhausted, the waste will be trucked to Landfill (to be confirmed in consultation with the municipality).

Will the activity produce solid waste during its operational phase?

<input type="checkbox"/>	<b>NO</b> ✓
--------------------------	----------------

If YES, what estimated quantity will be produced per month?

n/a
-----

How will the solid waste be disposed of (describe)?

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? **NO** ✓

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility? **NO** ✓

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

**b) Liquid effluent**

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? **NO** ✓

If YES, what estimated quantity will be produced per month? m<sup>3</sup>

Will the activity produce any effluent that will be treated and/or disposed of on site? **NO** ✓

*If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.*

Will the activity produce effluent that will be treated and/or disposed of at another facility? **NO** ✓

If YES, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Water will be used for the cleaning of panels during operation and for dust suppression during construction. Waste water (other than normal sewage) will not be produced.



### c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

	<b>NO</b> ✓
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If YES, is it controlled by any legislation of any sphere of government?

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

During construction dust and vehicle emissions will be generated. The contractor would need to adhere to the Environmental Management Programme for mitigation measures.

PV installations convert solar energy into electricity, and consume no fuel during operation. PV installations produce an insignificant quantity of greenhouse gases over their lifecycle when compared to conventional coal-fired power stations. The operational phase of a solar facility produces little to zero carbon dioxide, sulphur dioxide, mercury, particulates, or any other type of air pollution.

### d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?

	<b>NO</b> ✓
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If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

### e) Generation of noise

Will the activity generate noise?

	<b>NO</b> ✓
--	----------------

If YES, is it controlled by any legislation of any sphere of government?

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the noise in terms of type and level:

A limited amount of noise will be generated during the construction phase of the facility due to movement of heavy machinery on site. The operation phase will not generate any noise.

## 13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

<b>Municipal</b> ✓	Water board	Groundwater	River, stream, dam or lake	<b>Other</b>	The activity will not use water
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The source of water has not been confirmed at this stage. Alternative water sources could be supplied by the municipality, or a borehole identified in the vicinity of suitable yield.

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?

	<b>NO</b> ✓

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

N/A
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#### 14. ENERGY EFFICIENCY

Describe the design measures, if any that have been taken to ensure that the activity is energy efficient:

The activity is in itself an activity that is proposed to generate electricity from a cleaner alternative energy source (i.e. solar radiation).
---

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The purpose of a PV installation is to utilise a renewable energy source (i.e. solar radiation) for the production of electricity. Therefore it is not required to consider any additional alternative energy sources.
--

## SECTION B: SITE/AREA/PROPERTY DESCRIPTION

### Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A):

- Paragraphs 1 - 6 below must be completed for each alternative.
- Has a specialist been consulted to assist with the completion of this section? 

<b>YES</b> ✓	
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If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in **Appendix D**.

<b>Property description/physical address:</b>	<b>Province</b>	North West Province
	<b>District Municipality</b>	Dr Ruth Segomotsi Mompati District Municipality
	<b>Local Municipality</b>	Kagisano - Molopo Local Municipality
	<b>Ward Number(s)</b>	1
	<b>Farm name and number</b>	Portion 2 of the Farm Helpmekaar 248 IN
	<b>Portion number</b>	Portion 2
	<b>SG Code</b>	T0IN0000000024800002

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

**Current land-use zoning as per local municipality IDP/records:**

Agriculture (beef production)
-------------------------------

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?

<b>YES</b> ✓	
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### 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

#### Alternative S1:

<b>Flat</b> ✓	1:50	-	1:20	-	1:15	-	1:10	-	1:7,5	-	Steeper than 1:5
	1:20		1:15		1:10		1:7,5		1:5		

#### Alternative S2 (if any):

Flat	1:50	-	1:20	-	1:15	-	1:10	-	1:7,5	-	Steeper than 1:5
	1:20		1:15		1:10		1:7,5		1:5		

#### Alternative S3 (if any):

Flat	1:50	-	1:20	-	1:15	-	1:10	-	1:7,5	-	Steeper than 1:5
	1:20		1:15		1:10		1:7,5		1:5		

### 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline	<input type="checkbox"/>	2.4 Closed valley	<input type="checkbox"/>	2.7 Undulating plain / low hills	<input type="checkbox"/>
2.2 Plateau	<input type="checkbox"/>	2.5 Open valley	<input type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input type="checkbox"/>	<b>2.6 Plain</b>	<input checked="" type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>

### 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

	<b>Alternative S1:</b>	<b>Alternative S2 (if any):</b>		<b>Alternative S3 (if any):</b>		
Shallow water table (less than 1.5m deep)		NO	YES	NO	YES	NO
Dolomite, sinkhole or doline areas		NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)		NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil		NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)		NO	YES	NO	YES	NO

	<b>Alternative S1:</b>	<b>Alternative S2 (if any):</b>	<b>Alternative S3 (if any):</b>
Soils with high clay content (clay fraction more than 40%)	<b>NO</b> ✓	YES NO	YES NO
Any other unstable soil or geological feature	<b>NO</b> ✓	YES NO	YES NO
An area sensitive to erosion	<b>NO</b> ✓	YES NO	YES NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

#### 4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition <sup>E</sup> ✓	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	<b>Cultivated land</b>	Paved surface	Building or other structure	<b>Bare soil</b>

If any of the boxes marked with an “<sup>E</sup>” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

**An Ecological assessment has been completed for the proposed facility - refer to Appendix D1.**

#### 5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	<b>NO</b> ✓	
Non-Perennial River (Drainage lines)	YES✓	
Permanent Wetland	<b>NO</b> ✓	
Seasonal Wetland	<b>NO</b> ✓	

Artificial Wetland		NO✓	
Estuarine / Lagoonal wetland		NO✓	

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

The Dispi, a non-perennial drainage line, occurs to the west of the R377 and within 150m to the east of the proposed 5MW PV facility. This drainage line is mapped by the National Freshwater Ecosystem Priority Areas assessment. The drainage line is, however, outside the development area and a direct impact by the PV facility is highly unlikely, although the power line will be required to cross the watercourse in order to tie into the Edwardsdam Substation, which may result in indirect impacts. There is some exposed calcrete in this area, indicative of shallow soils and the potential for the development of pans and waterlogging. However, this area was very dry at the time of the site visit undertaken by the ecologist and while it is possible that water gathers in this area, this does not appear to be a regular occurrence and probably only occurs under exceptional circumstances.

## 6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

<b>Natural area</b> ✓	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station <sup>H</sup>
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential <sup>A</sup>	Church	<b>Agriculture</b> ✓
Retail commercial & warehousing	Old age home	River, stream or wetland✓ (Drainage Line)
Light industrial	Sewage treatment plant <sup>A</sup>	Nature conservation area
Medium industrial <sup>AN</sup>	Train station or shunting yard <sup>N</sup>	Mountain, koppie or ridge
Heavy industrial <sup>AN</sup>	Railway line <sup>N</sup> ✓	Museum
Power station	Major road (4 lanes or more) <sup>N</sup>	Historical building
Office/consulting room	Airport <sup>N</sup>	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam <sup>A</sup>	Sport facilities	Archaeological site

Quarry, sand or borrow pit	Golf course	<b>Other land uses: An existing 88 kV power line bisects the property</b>
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If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity?

Not applicable

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	<b>YES ✓</b>	
Core area of a protected area?		<b>NO ✓</b>
Buffer area of a protected area?		<b>NO ✓</b>
Planned expansion area of an existing protected area?		<b>NO ✓</b>
Existing offset area associated with a previous Environmental Authorisation?		<b>NO ✓</b>
Buffer area of the SKA?		<b>NO ✓</b>

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

**A map indicating the location of the site within a Level 2 terrestrial Critical Biodiversity Area is provided in Appendix A.**

## 7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:

**NO ✓**

The impacts to heritage resources by the proposed development are considered to be low and no further mitigation is proposed. No archaeological sites were identified during the survey and desktop study. The study area is located well outside of the known distribution of Iron Age sites in the North West province and no Iron Age sites were recorded. No Stone Age material was recorded in the study area and this can be attributed to the lack of raw material suitable for knapping and also the lack of water sources (like pans) and landscape features like hills or rocky outcrops that would have attracted human activity in the past within the immediate study area. There are no buildings or other structures within the development footprint and therefore no impact on the built environment is expected.

To the east of the proposed development site there is a dilapidated old farm house but it is well away from the proposed development and no impact is foreseen on the site. No cultural landscape elements (e.g windmills, water troughs etc) occur in the development footprint.

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

Will any building or structure older than 60 years be affected in any way?		<b>NO</b> ✓
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?		<b>NO</b> ✓

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

## PALAEONTOLOGY

A paleontological study was undertaken by Dr John Almond. The following is of relevance:

**Geological background:** The study area is entirely underlain by Quaternary aeolian (wind-blown) sands of the Gordonia Formation (Kalahari Group) that in turn mantle Precambrian granitic basement rocks.

**Palaeontological potential:** The fossil record of the Kalahari Group is generally sparse and low in diversity (Almond & Pether 2008). The Gordonia Formation dune sands were mainly active during cold, drier intervals of the Pleistocene Epoch that were inimical to most forms of life, apart from hardy, desert-adapted species. Porous dune sands are not generally conducive to fossil preservation. However, mummification of soft tissues may play a role here and migrating lime-rich groundwaters derived from the underlying rocks may lead to the rapid calcretisation of organic structures such as animal burrows and root casts. Occasional terrestrial fossil remains that might be expected within this unit include calcretized rhizoliths (root casts) and termitaria (e.g. *Hodotermes*, the harvester



termite), ostrich egg shells (Struthio) and shells of land snails (e.g. Trigonephrus) (Almond 2008, Almond & Pether 2008). Other fossil groups such as freshwater bivalves and gastropods (e.g. Corbula, Unio) and snails, ostracods (seed shrimps), charophytes (stonewort algae), diatoms (microscopic algae within siliceous shells) and stromatolites (laminated microbial limestones) are associated with local watercourses and pans. Microfossils such as diatoms may be blown by wind into nearby dune sands (Du Toit 1954, Dingle et al., 1983). These Kalahari fossils (or subfossils) can be expected to occur sporadically but widely, and the overall palaeontological sensitivity of the Gordonia Formation is therefore considered to be low.

The Stella Helpmekaar Solar Energy Facility study area near Stella, North West Province, is generally of LOW palaeontological sensitivity.

## 8. SOCIO-ECONOMIC CHARACTER

### a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

#### Overview of key demographic indicators for the Naledi Local Municipality

ASPECT	2011
<b>Population</b>	105 789
<b>Households</b>	28 531
<b>Household size (average)</b>	3.6
<b>% Female headed households</b>	47.8
<b>Sex Ratio (males per 100 females)</b>	92.8
<b>Dependency ratio per 100 (15-64)</b>	77.1
<b>% Population &lt;15 years</b>	37.6
<b>% Population 15-64</b>	56.5
<b>% Population 65+</b>	5.9
<b>Unemployment rate (official)</b>	<b>30.2</b>
<b>- % of economically active population</b>	
<b>Youth unemployment rate (official)</b>	38.8
<b>- % of economically active population 15-34</b>	
<b>No schooling - % of population 20+</b>	28.6
<b>Higher Education - % of population 20+</b>	4.5
<b>Matric - % of population 20+</b>	14

Source: Compiled from StatsSA Census 2011 Municipal Fact Sheet

Economic profile of local municipality:

The Kagisano-Molopos key economic sectors is agricultural and specifically cattle breeding activities.

Level of education:

With regard to education levels, the portion of the population older than 20 years without formal education 16.6. The percentage of the educated adult population is very low with tertiary and secondary qualifications being 4.5% and 14% respectively.

**b) Socio-economic value of the activity**

What is the expected capital value of the activity on completion?	R100 million
What is the expected yearly income that will be generated by or as a result of the activity?	R12 million
Will the activity contribute to service infrastructure?	YES
Is the activity a public amenity?	NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Approximately 80 5% highly skilled / 20% skilled / 75% unskilled
What is the expected value of the employment opportunities during the development and construction phase?	This will become known after an initial total price has been calculated for the project.
What percentage of this will accrue to previously disadvantaged individuals?	80%
How many permanent new employment opportunities will be created during the operational phase of the activity?	Approximately 20
What is the expected current value of the employment opportunities during the first 10 years?	Not known at this stage
What percentage of this will accrue to previously disadvantaged individuals?	20% to be employed from PDI as a minimum standard in accordance with the Department of Energy requirements

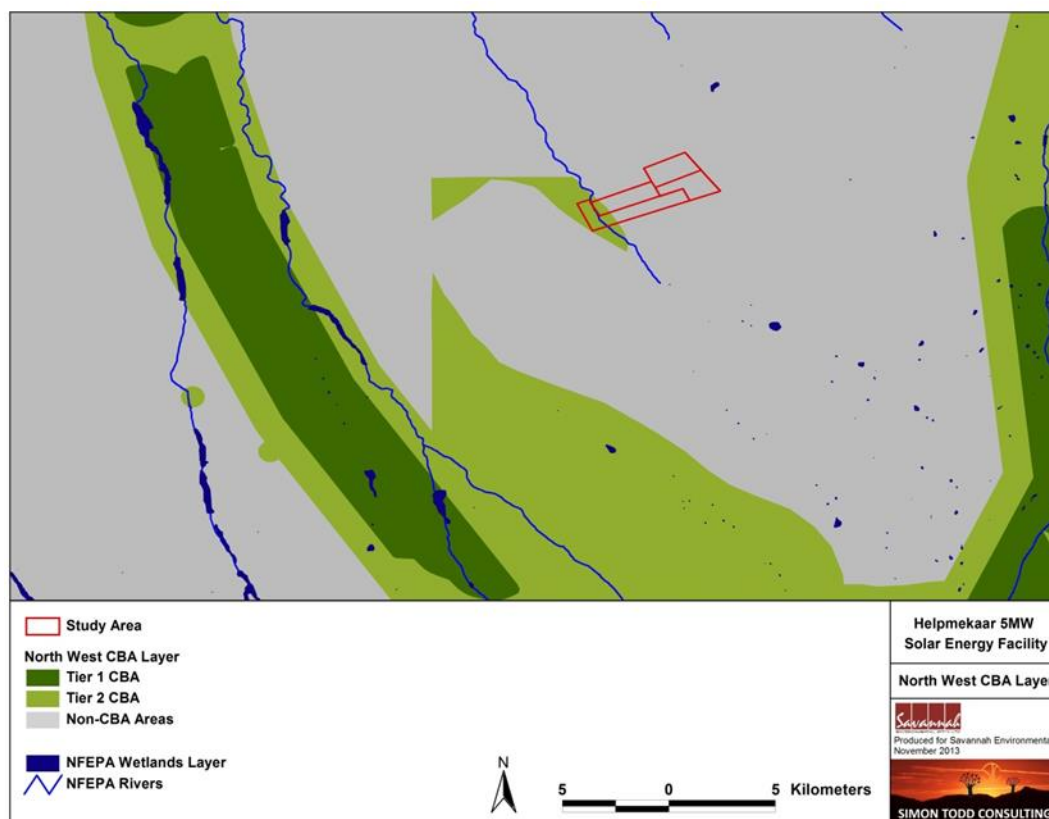
**9. BIODIVERSITY**

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or [BGIShelp@sanbi.org](mailto:BGIShelp@sanbi.org). Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's

responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as **Appendix D** to this report.

**a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

<b>Systematic Biodiversity Planning Category</b>				<b>If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan</b>
<b>Critical Biodiversity Area (CBA)</b> ✓	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	<p>The site falls within the planning domain of the North West Province Biodiversity Conservation Assessment (Skowno &amp; Desmet 2008), which maps Critical Biodiversity Areas and Ecological Support Areas within the North West Province.</p> <p>The south-western part of the site which includes the proposed development area lies within a Tier 2 Critical Biodiversity Area. Further transformation of areas classified as CBAs is highly undesirable, but as determined by the ecological specialist site visit and mapping of the Remaining Extent of Threatened Ecosystems layer (SANBI 2011) i, the development area is within an area that has been ploughed and no longer contains much residual biodiversity. The only potential impact of the development would therefore be on broad-scale ecological processes such as the connectivity of the landscape. As there are ample intact areas of Mafikeng Bushveld (listed as Vulnerable) immediately adjacent to the site, it is also clear that this is a highly unlikely impact.</p> <p>Although the site is within an area that is classified as a CBA, it is transformed through agricultural practices and it is clear that the development area does not represent an area of significance for biodiversity processes. Given the highly impacted nature of the site, it is considered a favourable location for the development of a solar energy facility and very little specific mitigation would be required to maintain the impact of the development at a low level.</p>

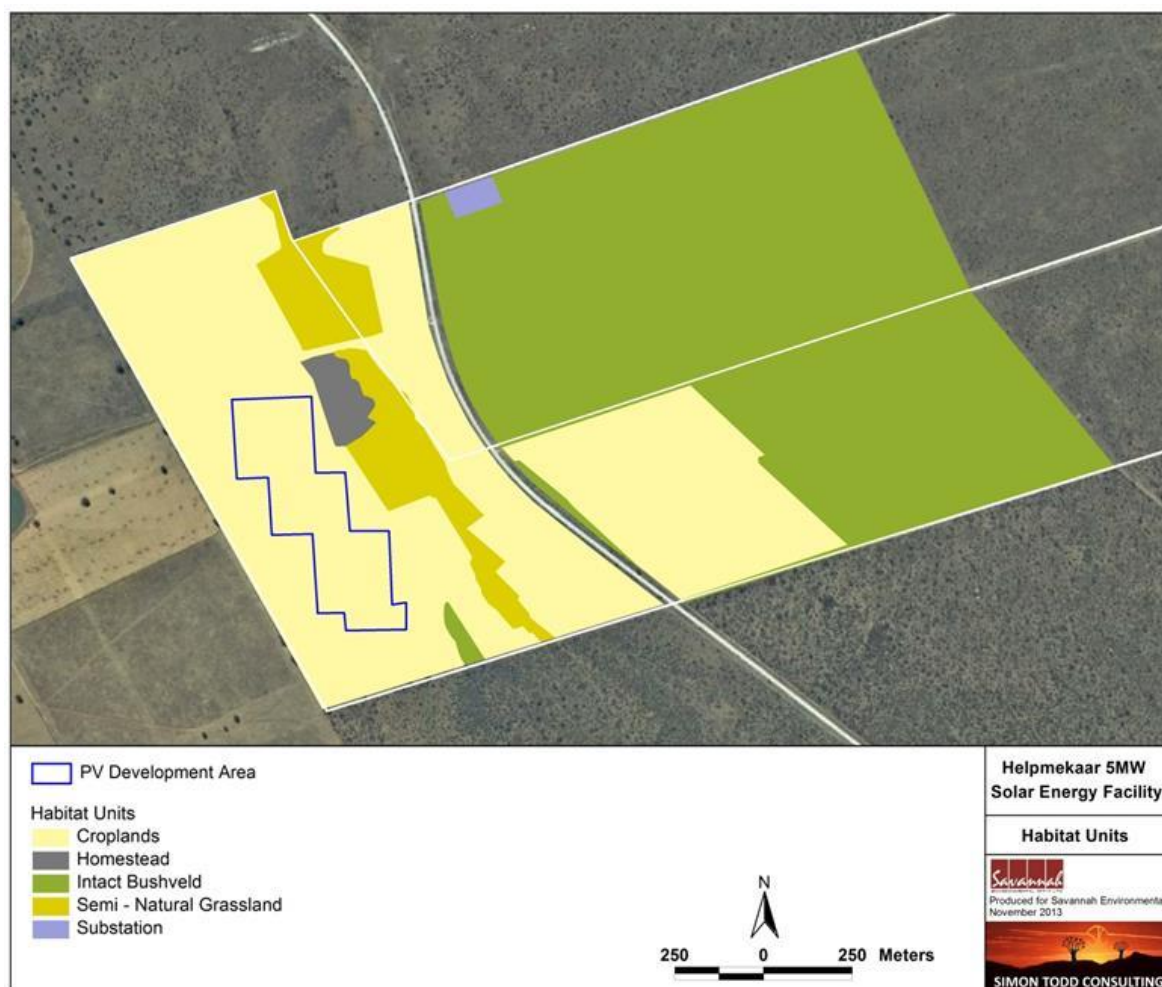


**Figure 9:** The Critical Biodiversity Areas map for the area in and around the proposed Stella Helpmekaar 5MW Solar Energy Facility, from Skowno & Desmet (2008).

**b) Indicate and describe the habitat condition on site**

<b>Habitat Condition</b>	<b>Percentage of habitat condition class (adding up to 100%)</b>	<b>Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).</b>
Natural	0%	
Near Natural (includes areas with low to moderate level of alien invasive plants)	2%	In general alien species abundance at the site was low and apart from some individuals of <i>Argemone ochroleuca</i> and <i>Verbesina encelioides</i> var <i>encelioides</i> , there were few other alien species present.
Degraded (includes areas heavily invaded by alien plants)	0%	

Transformed (includes cultivation, dams, urban, plantation, roads, etc)	98%	According to the agricultural study conducted, the natural vegetation on the area where the PV facility is proposed has been completely eradicated by cultivation. As a result the current biodiversity value of the proposed development area is very low and is not likely to be a significant habitat for most fauna.
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**Figure 10:** The different habitat units as identified during the site visit, in and around the proposed Stella Helpmekaar 5MW Solar Energy Facility

**c) Complete the table to indicate:**

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

<b>Terrestrial Ecosystems</b>		<b>Aquatic Ecosystems</b>		
<b>Ecosystem threat status as per the National Environmental</b>	Critical	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and	Estuary	Coastline
	Endangered			
	<b>Vulnerable</b> ✓			

Terrestrial Ecosystems		Aquatic Ecosystems				
<b>Management:                      Biodiversity Act                      (Act No. 10 of                      2004)</b>	Least Threatened	artificial wetlands)				
		<b>YES</b> ✓			<b>NO</b> ✓	<b>NO</b> ✓

**d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)**

**Vegetation - regional description:** According to the national vegetation map (Mucina & Rutherford 2006), the entire site falls within the Mafikeng Bushveld vegetation type. This vegetation type is restricted to the Northern Province and occupies 14389 km<sup>2</sup> from west of Mafikeng and south of the Botswana border westwards to around Vergelee and south to Piet Plessis and Setlagole. In general this vegetation type is characterised by a well-developed tree and shrub layer with dense stands of *Terminalia sericea*, *Acacia luederitzii* and *Acacia erioloba* in some areas. Other typical species include *Acacia karoo*, *Acacia hebeclada*, *Acacia mellifera*, *Dichrostachys cinerea*, *Grewia flava*, *Grewia retinervis*, and *Zizyphus mucronata*. In terms of geology and soils, Mafikeng Bushveld occurs on Aeolian Kalahari sand on flat sandy plains with relatively deep soils of the Clovelly and Hutton forms. Landtypes are Ah, Ai and Ae. No endemic species are known from this vegetation type. Approximately 75% of the Mafikeng Bushveld vegetation type is considered intact and according to the National List of Threatened Ecosystems (2011) it is considered Vulnerable. The main agent of transformation to date is from cropping and further loss of this vegetation type is considered undesirable.

**Vegetation description of the site:** The proposed development area is located within a cropland, that at the time of the site visit had been planted to dryland beans. As a result, there was minimal biodiversity within the development area itself, apart from some alien species such as *Argemone ochroleuca* and *Verbesina encelioides* var *encelioides*. There were some woody species remaining around the margin of the cropland including *Acacia erioloba*, *Zizyphus mucronata*, *Diospyros austro-africana*, *Grewia flava*, *Acacia hebeclada* and *Ehretia rigida* subsp. *rigida*.

In the wider area, there is also a disturbed area associated with an old farmstead as well as several other croplands and the Eskom Substation. As the development area is restricted to the cropland area, it is unlikely that any of the other habitats present would be significantly affected by the development.

**Aquatic ecosystems:** There is a drainage line mapped by the National Freshwater Ecosystem Priority Areas assessment (NFEPA) which occurs approximately 150m east of the proposed PV development area. There is some exposed calcrete in this area,

indicative of shallow soils and the potential for the development of pans and waterlogging. However, this area seemed very dry at the time of the site visit and while it is possible that water gathers in this area, this does not appear to be a regular occurrence and probably only occurs under exceptional circumstances. This area is however outside the development area and a direct impact on this area is highly unlikely although the power line will need to cross the watercourse to tie into the Edwardsdam Substation resulting in potential indirect impacts.

## SECTION C: PUBLIC PARTICIPATION

### 1. ADVERTISEMENT AND NOTICES

<b>Publication name</b>	Stellalander and Overvaal	
<b>Date published</b>	20 November 2013 and 22 November 2013 respectively	
<b>Date published</b>	Notification of draft BAR review period: 6 December 2013	
<b>Site notice position</b>	<b>Latitude</b>	<b>Longitude</b>
	26° 15' 46.40" S	24° 34' 14.14" E
	26° 15' 52.00" S	24° 33' 54.36" E
<b>Date placed</b>	12 November 2013	

Include proof of the placement of the relevant advertisements and notices in **Appendix E1**.

### 2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2)(e) and 54(7) of GN R.543.

Key stakeholders (other than organs of state) identified in terms of Regulation 54(2)(b) of GN R.543:

- » Site notices were placed on the intersection of the site access road and the R377 and on the northern point of the proposed PV site on the farm access road
- » Adverts were placed in the Stellalander (Regional newspaper) and Overvaal (regional and local newspapers) to notify the public of the proposed project, request registration of Interested and Affected Parties and advertise the comment period of the Draft Basic Assessment Report.
- » A Background Information Document (BID) was distributed to key stakeholders and surrounding landowners and placed on the website: [www.savannahsa.com](http://www.savannahsa.com).

Include proof that the key stakeholder received written notification of the proposed activities as **Appendix E2**. This proof may include any of the following:

- » e-mail delivery reports;
- » registered mail receipts;
- » courier waybills;
- » signed acknowledgements of receipt; and/or
- » or any other proof as agreed upon by the competent authority.



### 3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Summary of response from EAP
No comments have been received to date	

### 4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as **Appendix E3**.

**Note: No comments have been received to date.** All comments received during the public review period will be included within a Comments and Responses Report within the Final BAR.

### 5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

- North West - Department of Economic Development, Environment, Conservation and Tourism
- North West Province Department of Agriculture and Rural Development
- North West Province Department of Local Government and Traditional Affairs
- North West Province Department of Public Works, Roads and Transport
- North West Provincial Heritage Resources Agency (NWPHRA)
- South African Heritage Resources Agency (SAHRA)
- Kagisano-Molopo Local Municipality
- Dr Ruth Segomotsi Mompati District Municipality
- SANRAL
- SKA Project Office
- Eskom
- Department of Energy
- National Department of Agriculture, Forestry and Fisheries
- Department of Water Affairs
- Civil Aviation Authority

Include proof that the Authorities and Organs of State received written notification of the proposed activities as **Appendix E4**.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

## **6. CONSULTATION WITH OTHER STAKEHOLDERS**

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs is included as **Appendix E5**.

Copies of any correspondence and minutes of any meetings held must be included in **Appendix E6**.

No comments have been received to date. Comments to be included following review of the draft Basic Assessment Report.

## **SECTION D: IMPACT ASSESSMENT**

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### **1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES**

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A (2) of this report.

A summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase and decommissioning phases of the proposed Stella Helpmekaar Solar Energy Facility is provided in the table overleaf.

Activity	Impact summary	Significance	Proposed mitigation
<b>CONSTRUCTION</b>			
<b>Alternative 1 - 5MW PV array and power line parallel to existing roads to connect to Edwardsdam Substation (~950m)</b>			
<b>Ecological impacts</b>			
Vegetation clearing and construction activity	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>» Impacts on vegetation and listed plant species may occur due to vegetation clearing and disturbance associated with preconstruction activities.</li> </ul>	Low	<ul style="list-style-type: none"> <li>» Avoid sensitive areas such as intact areas of Mafikeng Bushveld.</li> <li>» Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.</li> <li>» All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed.</li> <li>» Temporary lay-down areas should be located within previously transformed areas.</li> </ul>
	Disturbance or persecution of fauna during the preconstruction phase may occur.	Low	<ul style="list-style-type: none"> <li>» Site access to be controlled and no unauthorized persons should be allowed onto the site.</li> <li>» The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden.</li> <li>» No fires to be allowed on site.</li> <li>» No fuelwood collection should be allowed on-site.</li> <li>» No dogs should be allowed on site.</li> <li>» No hazardous materials should be stored on site. Any accidental chemical, fuel and oil spills that occur at the site during preconstruction should be cleaned up in the appropriate manner as related to the nature of the spill.</li> <li>» No open excavations, holes or pits should be left at the site as smaller fauna and invertebrates may fall</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>» There should be very little residual impact.</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» Impact on Critical Biodiversity Areas - The site lies within a CBA and the development may impact biodiversity processes.</li> <li>» The potential for cumulative impacts is low as the affected area has already been transformed.</li> <li>» During the construction phase the activity would contribute somewhat to cumulative fauna disturbance and disruption in the area, but the impact would be local extent and not of high significance.</li> </ul>	<p>Low</p>	<p>in and become trapped.</p> <p>N/A</p> <ul style="list-style-type: none"> <li>» A cover of indigenous grasses should be established as a ground cover within the facility to bind the soil, prevent erosion and encourage smaller fauna.</li> <li>» Fauna within the site which do not pose a danger to humans or the operation of the facility should be tolerated.</li> </ul>
<b><u>Visual impacts</u></b>			
<p>Construction and operation of the PV array, access roads and associated infrastructure.</p>	<p><b>Direct impacts:</b></p> <p><b>Visual Impacts</b></p> <ul style="list-style-type: none"> <li>» Impact of initial site works, construction camp, site set up, setting out, laying services, ground works</li> <li>» Impact of the hauling and delivery of all construction materials on local roads and during the contract period, construction of access junction, site roads.</li> <li>» Impact of the building construction works to completion</li> </ul>	<p>Low</p>	<ul style="list-style-type: none"> <li>» Establish screening structures to shield construction works from sensitive receptors; good traffic and site management and keeping local people informed. Minimise construction period.</li> <li>» Good traffic management at access junction, good site management, and keeping local people and road users informed</li> <li>» Laydown areas and construction camp screened where required. Operate site within construction industry management guidelines, time limit on contract period.</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>» There could be some limited ground contamination</li> <li>» Disturbed ground which may be kept clear; the PV array associated buildings and power evacuation infrastructure</li> </ul>	Low	» None
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» None</li> </ul>	N/A	» None
<b><u>Soil &amp; Agricultural Impacts</u></b>			
Direct occupation of land by footprint of energy facility infrastructure	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>» Loss of agricultural land use</li> </ul>	Medium	» No mitigation possible
	<ul style="list-style-type: none"> <li>» Soil erosion by wind and water - there is low risk of water erosion but higher risk of wind erosion.</li> </ul>	Low	<ul style="list-style-type: none"> <li>» Implement an effective system of run-off control which collects and disseminates run-off water from hardened surfaces and prevents potential down slope erosion. This should be in place and maintained during all phases of the development.</li> <li>» Encourage and maintain vegetation growth throughout the site to stabilize the soil against wind erosion.</li> </ul>
	<ul style="list-style-type: none"> <li>» Loss of topsoil caused by poor topsoil management (burial, erosion, etc) during construction related soil profile disturbance (levelling, excavations, disposal of spoils from excavations etc.)</li> </ul>	Low	<ul style="list-style-type: none"> <li>» Strip and stockpile topsoil from all areas where soil will be disturbed.</li> <li>» After cessation of disturbance, re-spread topsoil over the surface.</li> <li>» Dispose of any sub-surface spoils from excavations where they will not impact on agricultural land, or where they can be effectively covered with topsoil.</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>» None</li> </ul>	N/A	

Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» The overall loss of agricultural land in the region due to other developments. The significance is low due to the limited agricultural potential of the development sites in the area, and the small extent of this proposed development.</li> </ul>	Low	No mitigation required
<b>Social impacts</b>			
<p><b>Construction phase</b> (Including all related infrastructure such as transmission lines, access roads, office and warehouse components) and</p>	<p><b>Direct impacts:</b></p> <p><b>Positive social impacts:</b></p> <ul style="list-style-type: none"> <li>» Creation of employment and business opportunities.</li> </ul> <p><b>Potential negative impacts:</b></p> <ul style="list-style-type: none"> <li>» Influx of construction workers employed on the project to the area and impact on hospitality sector;</li> <li>» Increased risk of stock theft, poaching and damage to farm infrastructure associated with construction workers;</li> <li>» Increased risk of veld fires associated with construction related activities;</li> <li>» Impact of heavy vehicles, including damage to roads, safety, noise and dust;</li> <li>» Loss of agricultural land associated with construction related activities.</li> </ul>	Low	<ul style="list-style-type: none"> <li>» Where possible, the applicant should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically semi and low-skilled job categories. This will reduce the potential impact that this category of worker could have on local family and social networks;</li> <li>» Maximise the use of local labour for low – semi skilled jobs far as possible.</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>» Local employed people during the construction phase may learn new skills thereby making them more employable in the future.</li> </ul>	Low (+)	<ul style="list-style-type: none"> <li>» The developer should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's and locals employed during the</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Cumulative impacts:</b></p> <p>» Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.</p>	Low	<p>operational phase of the project.</p> <p>» Attention should be given to the extension and improvement of the existing HIV/Aids awareness programmes in the area.</p>
<b>Heritage impacts</b>			
Construction and operation of the PV array, access roads and associated infrastructure.	<p><b>Direct impacts:</b></p> <p>» Impacts on archaeological sites not evident on the site and which could be unearthed during construction.</p>	Low	<p>» If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.</p>
	<p><b>Indirect impacts:</b></p> <p>None</p>	N/A	<p>» None</p>
	<p><b>Cumulative impacts:</b></p> <p>» The loss of a number of archaeological sites as a result of numerous developments in the area.</p>	Low	<p>» None</p>
<b>Palaeontology impacts</b>			
Construction and operation of the PV array, access roads and associated infrastructure.	<p><b>Direct impacts:</b></p> <p>» Any damage that occurs to fossil material during the excavation and construction phase of the project would be permanent and irreversible.</p>	Low	<p>» Any substantial fossil remains (e.g. stromatolites, fossil shells, petrified wood or plant remains, vertebrate bones, teeth) encountered during excavation should be reported to SAHRA</p>



Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Indirect impacts:</b> None</p>		» None
	<p><b>Cumulative impacts:</b> » The loss of a number of palaeontological findings as a result of numerous developments in the area.</p>	Low	» None
<p><b>Alternative 2 - 5MW PV array and power line parallel to existing overhead transmission line to connect to Edwardsdam Substation (~950m)</b></p>			
<p><b>Ecological impacts</b></p>			
Vegetation clearing and construction activity	<p><b>Direct impacts:</b> » Impacts on vegetation and listed plant species may occur due to vegetation clearing and disturbance associated with preconstruction activities.</p> <p>This impact is increased with this alternative as the power line will traverse areas of medium to high ecological sensitivity.</p>	Low	<ul style="list-style-type: none"> <li>» Avoid sensitive areas such as intact areas of Mafikeng Bushveld.</li> <li>» Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.</li> <li>» All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed.</li> <li>» Temporary lay-down areas should be located within previously transformed areas.</li> </ul>
	<p>» Disturbance or persecution of fauna during the preconstruction phase may occur.</p> <p>This impact is increased with this alternative as the power line will traverse areas of medium to high ecological sensitivity.</p>	Low	<ul style="list-style-type: none"> <li>» Site access to be controlled and no unauthorized persons should be allowed onto the site.</li> <li>» The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden.</li> <li>» No fires to be allowed on site.</li> <li>» No fuelwood collection should be allowed on-site.</li> <li>» No dogs should be allowed on site.</li> <li>» No hazardous materials should be stored on site.</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
			<p>Any accidental chemical, fuel and oil spills that occur at the site during preconstruction should be cleaned up in the appropriate manner as related to the nature of the spill.</p> <ul style="list-style-type: none"> <li>» No open excavations, holes or pits should be left at the site as smaller fauna and invertebrates may fall in and become trapped.</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>» There should be very little residual impact.</li> </ul>	Low	N/A
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» Impact on Critical Biodiversity Areas - The site lies within a CBA and the development may impact biodiversity processes.</li> <li>» The potential for cumulative impacts is low as the affected area has already been transformed.</li> <li>» During the construction phase the activity would contribute somewhat to cumulative fauna disturbance and disruption in the area, but the impact would be local extent and not of high significance.</li> </ul>	Low	<ul style="list-style-type: none"> <li>» A cover of indigenous grasses should be established as a ground cover within the facility to bind the soil, prevent erosion and encourage smaller fauna.</li> <li>» Fauna within the site which do not pose a danger to humans or the operation of the facility should be tolerated.</li> </ul>
<b><u>Visual impacts</u></b>			
<p>Construction and operation of the PV array, access roads and associated infrastructure.</p>	<p><b>Direct impacts:</b></p> <p><b>Visual Impacts</b></p> <ul style="list-style-type: none"> <li>» Impact of initial site works, construction camp, site set up, setting out, laying services, ground works</li> <li>» Impact of the hauling and delivery of all construction materials on local roads and during the contract period, construction of</li> </ul>	Low	<ul style="list-style-type: none"> <li>» Establish screening structures to shield construction works from sensitive receptors; good traffic and site management and keeping local people informed. Minimise construction period.</li> <li>» Good traffic management at access junction, good site management, and keeping local people and road users informed</li> <li>» Laydown areas and construction camp screened</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
	<p>access junction, site roads.</p> <p>» Impact of the building construction works to completion</p> <p>The significance of this impact is lower for this Route Alternative as power line construction activities will occur adjacent to the road.</p>		<p>where required. Operate site within construction industry management guidelines, time limit on contract period.</p>
	<p><b>Indirect impacts:</b></p> <p>» There could some limited ground contamination</p> <p>» Disturbed ground which may be kept clear; the SEF, associated buildings and power evacuation infrastructure</p>	Low	» None
	<p><b>Cumulative impacts:</b></p> <p>» None</p>	N/A	» None
<b>Soil &amp; Agricultural Impacts</b>			
Direct occupation of land by footprint of energy facility infrastructure	<p><b>Direct impacts:</b></p> <p>» Loss of agricultural land use</p>	Medium	» No mitigation possible although loss of agricultural land lower in this alternative due to power line aligned with existing roads over a short distance.
	<p>» Soil erosion by wind and water - there is low risk of water erosion but higher risk of wind erosion.</p> <p>This impact is the same for both Route Alternatives</p>	Low	<p>» Implement an effective system of run-off control which collects and disseminates run-off water from hardened surfaces and prevents potential down slope erosion. This should be in place and maintained during all phases of the development.</p> <p>» Encourage and maintain vegetation growth throughout the site to stabilize the soil against wind erosion.</p>
	<p>» Loss of topsoil caused by poor topsoil management (burial, erosion, etc) during construction related soil profile disturbance (levelling, excavations, disposal of spoils from</p>	Low	<p>» Strip and stockpile topsoil from all areas where soil will be disturbed.</p> <p>» After cessation of disturbance, re-spread topsoil over the surface.</p>

Activity	Impact summary	Significance	Proposed mitigation
	excavations etc.)		» Dispose of any sub-surface spoils from excavations where they will not impact on agricultural land, or where they can be effectively covered with topsoil.
	<b>Indirect impacts:</b> » None	N/A	
	<b>Cumulative impacts:</b> » The overall loss of agricultural land in the region due to other developments. The significance is low due to the limited agricultural potential of the development sites in the area, and the small extent of this proposed development.	Low	No mitigation required
<b><u>Social impacts</u></b>			
<b>Construction phase</b> (Including all related infrastructure such as transmission lines, access roads, office and warehouse components) and	<b>Direct impacts:</b> <b>Positive social impacts:</b> » Creation of employment and business opportunities. <b>Potential negative impacts:</b> » Influx of construction workers employed on the project to the area and impact on hospitality sector; » Increased risk of stock theft, poaching and damage to farm infrastructure associated with construction workers; » Increased risk of veld fires associated with construction related activities; » Impact of heavy vehicles, including damage to roads, safety, noise and dust; » Loss of agricultural land associated with	Low	» Where possible, the applicant should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically semi and low-skilled job categories. This will reduce the potential impact that this category of worker could have on local family and social networks; » Maximise the use of local labour for low – semi skilled jobs far as possible.

Activity	Impact summary	Significance	Proposed mitigation
	construction related activities.		
	<p><b>Indirect impacts:</b></p> <p>» Local employed people during the construction phase may learn new skills thereby making them more employable in the future.</p>	Low (+)	<p>» The developer should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's and locals employed during the operational phase of the project.</p>
	<p><b>Cumulative impacts:</b></p> <p>» Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.</p>	Low	<p>» Attention should be given to the extension and improvement of the existing HIV/Aids awareness programmes in the area.</p>
<b><u>Heritage impacts</u></b>			
Construction and operation of the PV array, access roads and associated infrastructure.	<p><b>Direct impacts:</b></p> <p>» Impacts on archaeological sites not evident on the site and which could be unearthed during construction.</p> <p>This impact is the same for both Route Alternatives.</p>	Low	<p>» If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.</p>
	<p><b>Indirect impacts:</b></p> <p>None</p>	N/A	<p>» None</p>
	<p><b>Cumulative impacts:</b></p>	Low	<p>» None</p>

Activity	Impact summary	Significance	Proposed mitigation
	» The loss of a number of archaeological sites as a result of numerous developments in the area.		
<b><i>Palaeontology impacts</i></b>			
Construction and operation of the PV array, access roads and associated infrastructure.	<b><i>Direct impacts:</i></b> » Any damage that occurs to fossil material during the excavation and construction phase of the project would be permanent and irreversible.	Low	» Any substantial fossil remains (e.g. stromatolites, fossil shells, petrified wood or plant remains, vertebrate bones, teeth) encountered during excavation should be reported to SAHRA
	<b><i>Indirect impacts:</i></b> None		» None
	<b><i>Cumulative impacts:</i></b> » The loss of a number of palaeontological findings as a result of numerous developments in the area.	Low	» None
<b>Alternative 2</b>			
	<b><i>Direct impacts:</i></b>		
	<b><i>Indirect impacts:</i></b>		
	<b><i>Cumulative impacts:</i></b>		
<b>Alternative 3</b>			
	<b><i>Direct impacts:</i></b>		
	<b><i>Indirect impacts:</i></b>		
	<b><i>Cumulative impacts:</i></b>		

Activity	Impact summary	Significance	Proposed mitigation
<b>OPERATION</b>			
<b>Proposed 5MW facility and Route Alternative 1 and Route Alternative 2 (assessment relevant to all alternatives)</b>			
<b><u>Ecological impacts</u></b>			
Presence and operation of the facility	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>» The operation and presence of the facility may lead to disturbance or persecution of fauna. The impact will be the same for both power line Route Alternatives.</li> </ul>	Low	<ul style="list-style-type: none"> <li>» No unauthorized persons should be allowed onto the site.</li> <li>» Undesirable and problem fauna such snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location.</li> <li>» The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden.</li> <li>» No fires should only be allowed at the site.</li> <li>» No fuelwood collection should be allowed on-site.</li> <li>» No dogs should be allowed on site.</li> <li>» If the site must be lit at night for security purposes, this should be done with low-UV type lights (such as most LEDs), which do not attract insects.</li> <li>» All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</li> <li>» All vehicles accessing the site should adhere to a low speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises.</li> </ul>
	<b>Indirect impacts:</b>	Very Low	None

Activity	Impact summary	Significance	Proposed mitigation
	<p>The development is not likely to contribute significantly to cumulative faunal impacts as the site is already transformed and mitigation will reduce any additional impacts to a very low level.</p> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» The development is not likely to contribute significantly to cumulative faunal impacts as the site is already transformed and mitigation will reduce any additional impacts to a very low level.</li> </ul>		
Avifaunal impact	<ul style="list-style-type: none"> <li>» The operation and presence of the facility may lead to negative impacts on avifauna as a result of electrocution or collisions with the associated power transmission infrastructure.</li> <li>» The Edwardsdam 88/22 kV Substation is however within 700m from the site and it is not likely that the short power line (both Route Alternatives) would generate a significant impact.</li> </ul>	Low	<ul style="list-style-type: none"> <li>» Ensure that all new lines are marked with bird flight diverters along their entire length, but particularly in areas where larger birds are likely to pass such as near drainage lines, dams or pans and hills.</li> <li>» All new power line infrastructure should be bird-friendly in configuration and adequately insulated (Lehman et al. 2007). These activities should be supervised by someone with experience in this field.</li> <li>» Any electrocution and collision events that occur should be recorded, including the species affected and the date. If repeated collisions occur within the same area, then further mitigation and avoidance measures may need to be implemented.</li> </ul>
	<p><b>Indirect impacts:</b></p> <p>Despite mitigation, some mortality associated with the power lines may still occur.</p>		<ul style="list-style-type: none"> <li>» Ensure that all new lines are marked with bird flight diverters along their entire length, but particularly in areas where larger birds are likely to pass such as near drainage lines, dams or pans and hills.</li> <li>» All new power line infrastructure should be bird-friendly in configuration and adequately insulated (Lehman et al. 2007). These activities should be</li> </ul>



Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Cumulative impacts:</b></p> <p>» The development could contribute to cumulative avifaunal impacts in the area, but the contribution would be very small and is not considered significant.</p>		<p>supervised by someone with experience in this field.</p> <p>» Any electrocution and collision events that occur should be recorded, including the species affected and the date. If repeated collisions occur within the same area, then further mitigation and avoidance measures may need to be implemented.</p>
Increased alien plant invasion	<p>» Alien plants are likely to invade the site as there will be little indigenous plant cover present.</p> <p><b>Indirect impacts:</b> If alien species at the site are controlled, then there will be very little residual impact</p>	Low	<p>» Due to the disturbance at the site as well as the increased runoff generated at the site, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented.</p> <p>» Rehabilitation of cleared areas with indigenous grass species after construction to reduce alien invasion potential.</p> <p>» Regular monitoring for alien plants within the development footprint.</p> <p>» Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.</p> <p>» Due to the disturbance at the site as well as the increased runoff generated at the site, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be</p>

Activity	Impact summary	Significance	Proposed mitigation
			<p>implemented.</p> <ul style="list-style-type: none"> <li>» Rehabilitation of cleared areas with indigenous grass species after construction to reduce alien invasion potential.</li> <li>» Regular monitoring for alien plants within the development footprint.</li> <li>» Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.</li> </ul>
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» Alien invasion would contribute to cumulative habitat degradation in the area, but if alien species are controlled then, then cumulative impact from alien species would not be significant.</li> </ul>	Low	-
Increased erosion risk.	<ul style="list-style-type: none"> <li>» Increased erosion risk as a result of soil disturbance and loss of vegetation cover as well as increased runoff generated by the panels and access roads.</li> </ul>	Low	<ul style="list-style-type: none"> <li>» All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.</li> <li>» Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance.</li> <li>» All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> <li>» Wind erosion is already a problem at the site and a cover of indigenous grasses should be established in order to bind the soil and prevent erosion.</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>» If erosion at the site is controlled, then there will be no residual impact</li> </ul> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» Cumulative impacts are likely to very low after mitigation</li> </ul>		<ul style="list-style-type: none"> <li>» All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk.</li> <li>» Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance.</li> <li>» All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.</li> <li>» Wind erosion is already a problem at the site and a cover of indigenous grasses should be established in order to bind the soil and prevent erosion.</li> </ul> <p>-</p>
<b><u>Visual impacts</u></b>			
Maintenance and operation of proposed PV plant	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>» Effect on people living and working locally, change of local site character from agriculture to industrial</li> <li>» Impact from regular but not frequent, maintenance visits to clean the panels etc.</li> <li>» Impact on the colours, finishes, heights of the building, perimeter treatments</li> </ul>	Low	<p><b>Primary mitigation measures recommended by specialist:</b></p> <ul style="list-style-type: none"> <li>» Use of appropriate materials and colours for maintenance of buildings.</li> <li>» All built form should be erected in locations with minimal visual impact; i.e. buildings and inverters, etc should be grouped together as far as practicable.</li> </ul>
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>» The residual impacts would be mitigated by habituation to the visual impact. There are</li> </ul>	Low	<ul style="list-style-type: none"> <li>» Providing that the site is rehabilitated to its current state, the visual impact will also be removed.</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
	<p>semi-industrial uses locally.</p> <p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» A cumulative impact could be the extension of this facility, during its operational phase and that is not assessed here; based on present information there is no cumulative impact</li> <li>» It is not probable that buildings and fences would increase in number during the operational period. It is not probable that their functions and design would be altered.</li> </ul>	Low	<ul style="list-style-type: none"> <li>» Provided that the footprint of the individual sites is not enlarged and their positions remain as planned, the cumulative impact of the proposed activity is regarded to be insignificant.</li> </ul>
<b><u>Soil and agricultural impacts</u></b>			
Direct occupation of land by footprint of energy facility infrastructure	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>» Loss of agricultural land use</li> </ul>	Medium	<ul style="list-style-type: none"> <li>» No mitigation possible</li> </ul>
	<ul style="list-style-type: none"> <li>» Generation of alternative land use income providing land owners with increased cash flow and rural livelihood.</li> </ul>	High (+)	<ul style="list-style-type: none"> <li>» N/A</li> </ul>
	<ul style="list-style-type: none"> <li>» Soil erosion by wind and water</li> <li>» There is low risk of water erosion but higher risk of wind erosion.</li> </ul>	Low	<ul style="list-style-type: none"> <li>» Implement an effective system of run-off control which collects and disseminates run-off water from hardened surfaces and prevents potential down slope erosion. This should be in place and maintained during all phases of the development.</li> <li>» Encourage and maintain vegetation growth throughout the site to stabilize the soil against wind erosion.</li> </ul>
<b><u>Social impacts</u></b>			
Including all related infrastructure such as power lines, access roads, office and warehouse components	<p><b>Direct impacts:</b></p> <p><b>Positive social impacts:</b></p> <ul style="list-style-type: none"> <li>» Creation of employment and business operations</li> <li>» Benefits associated with the establishment of</li> </ul>	Medium -Low	<ul style="list-style-type: none"> <li>» Where possible, the applicant should employ locals.</li> </ul>

Activity	Impact summary	Significance	Proposed mitigation
	a local community trust; » The establishment of renewable energy infrastructure.		
	<b>Indirect impacts:</b> » Once the construction phase is complete, locals may not be able to find future employment.	Low	» The developer should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's and locals employed during the operational phase of the project.
	<b>Cumulative impacts:</b> » The cumulative impact on the social environment of other developments in the area would increase the positive and negative social impacts.	Medium to Low	» The developer should be aware of the other projects in the area and work closely with the local municipality for the development of the community trust.
<b>Alternative 2</b>			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
<b>Alternative 3</b>			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		

Activity	Impact summary	Significance	Proposed mitigation
<b>DECOMMISSIONING AND CLOSURE</b>			
<b>PV facility and Alternative Power Line Route 1 and Route 2</b>			
Facility decommissioning following end of economic life	Visual: » The major visual impact associated with the decommissioning of the facility is the residual visual effects such as scarring of the landscape.	Low	» This would be short-term and would reduce through rehabilitation of the site
	» Soil erosion	Low	» Care should be taken to control and contain storm water run-off and not to concentrate its runoff. » Rehabilitate the decommissioned area with species suitable to the desired land use
	» Dust production and dust pollution	Low	» Apply appropriate dust control measures, i.e. water spraying.
	» Disturbance or persecution of fauna during the decommissioning phase may occur.	Low	» Site access to be controlled and no unauthorized persons should be allowed onto the site. » The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. » No fires to be allowed on site. » No fuel wood collection should be allowed on-site. » No dogs should be allowed on site. » Any accidental chemical, fuel and oil spills that occur at the site during decommissioning should be cleaned up in the appropriate manner as related to the nature of the spill. » No open excavations, holes or pits should be left at the site as fauna can fall in and become trapped. » All disturbed areas should be rehabilitated with a

Activity	Impact summary	Significance	Proposed mitigation
			cover of indigenous grass.
	<ul style="list-style-type: none"> <li>» Alien plants are likely to invade the site as a result of disturbance created during decommissioning</li> </ul>		<ul style="list-style-type: none"> <li>» Due to the disturbance at the site during decommissioning, alien plant species are likely to invade the site and a long-term control plan will need to be implemented for several years after decommissioning</li> <li>» Regular monitoring for alien plants within the development footprint for 2-3 years after decommissioning.</li> <li>» Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.</li> <li>» Cleared and disturbed areas should be revegetated with a cover of indigenous grass.</li> </ul>

**NO-GO OPTION**

Construction, operation and decommissioning phase of the solar energy facility	<p><b>Direct impacts:</b></p> <ul style="list-style-type: none"> <li>» <b>Ecological impacts:</b> The no-go alternative has no impact on ecology, compared to the low impact for the development if it were to be implemented. The implementation of the no-go option will not lead to an improved ecological status assuming that some measure of ecological management is undertaken during the construction and operational phases.</li> <li>» <b>Agricultural impacts:</b> The 'do nothing'</li> </ul>	Low	<ul style="list-style-type: none"> <li>» None</li> </ul>
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	<p>alternative will result in no impact on the current land use (crops).</p> <ul style="list-style-type: none"> <li>» <b>Social impacts:</b> The no-go option would result in job opportunities not being realised resulting in further unemployment in the area.</li> <li>» <b>Visual impacts:</b> The visual character of the area would remain unchanged.</li> <li>» <b>Heritage impacts</b> The do-nothing alternative would have no impact on the heritage environment as no development would be undertaken which could potentially impact upon heritage resources.</li> </ul>		
	<p><b>Indirect impacts:</b></p> <ul style="list-style-type: none"> <li>» The No-Go option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producers of carbon emissions in the world, this would represent a high negative social cost.</li> <li>» The possibility that a different application to develop a PV facility may be made in respect of these sites.</li> </ul>	Low	» Implementation of the proposed project
	<p><b>Cumulative impacts:</b></p> <ul style="list-style-type: none"> <li>» Contributing to further unemployment and unsustainable ways to produce electricity</li> </ul>	Low	» Implementation of the proposed project

A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 must be included as **Appendix F**.



## 2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

### PV facility and Route Alternative 1 and Route Alternative 2

This section provides a summary of the environmental assessment and conclusions drawn for the proposed solar energy facility. In doing so, it draws on the information gathered as part of the Basic Assessment process and the knowledge gained by the environmental consultants during the course of the process and presents an informed opinion of the environmental impacts associated with the proposed project.

The following conclusions can be drawn from the studies undertaken within this Basic Assessment:

#### **Ecological impacts**

Sensitive areas identified on the greater farm portion include the intact areas of Mafikeng Bushveld, while the croplands, which includes the proposed 5MW PV facility is identified as a low sensitivity area. From an ecological perspective, the area where the 5MW PV facility is proposed is the best practicable environmental option. Given the highly impacted nature of the site, it is considered a favourable location for the development of a solar energy facility and very little specific mitigation would be required to maintain the impact of the development at a low level. With standard environmental good practice, no significant ecological impacts can be expected to occur.

In terms of both power line route alternatives assessed, the route aligned with existing roads will have a slightly lower impact than the alternative route aligned with the existing overhead transmission lines as Alternative 1 will be confined largely within low sensitivity areas mapped in the ecological assessment while Alternative 2 will cross areas of medium-high sensitivity. From an avifaunal perspective, it is not likely that the short length of power line would result in significant impacts during operation.

The summary of impacts for the construction, operation and decommissioning phases after mitigation for ecological impacts are provided in the table below.

	<b>5MW PV facility</b>
<b>Construction</b>	
Loss of Vegetation and Listed Species	Low
Faunal Impacts	Low
<b>Operation</b>	
Faunal Impacts	Low
Avifaunal Impacts	Low
Alien Plant Invasion Risk	Low
Increased Erosion Risk	Low
<b>Decommissioning</b>	
Faunal Impacts	Low
Alien Plant Invasion Risk	Low
<b>Cumulative Impacts</b>	
Impact on Critical Biodiversity Areas	Low

### **Agricultural impacts**

The farm has a land capability classification of class 5, non-arable, moderate potential grazing land. The proposed development will have low to medium negative impact on agricultural resources and productivity, but it will also deliver low to medium positive impacts on agriculture. Grazing and dryland crop farming will be able to continue unaffected on all other parts of the farm for the duration of and after the project. The significance of agricultural impacts is influenced by the fact that the site has limited agricultural potential, and constitutes a small portion in relation to other available land on the farm.

### **Heritage and palaeontological impact**

The impacts to heritage resources by the proposed development are considered to be low and no further mitigation is proposed. No archaeological sites were identified during the survey and desktop study. The study area is located well outside of the known distribution of Iron Age sites in the North West province and no Iron Age sites were recorded. No Stone Age material was recorded in the study area and this can be attributed to the lack of raw material suitable for knapping and also the lack of water sources (like pans) and landscape features like hills or rocky outcrops that would have attracted human activity in the past within the immediate study area. There are no buildings or other structures within the development footprint and therefore no impact on the built environment is expected.

### Visual impact

The solar energy is a semi-industrial land use and would be located in an agricultural area. It would be visible to users of the R377 and several farmsteads. The terrain and existing tree planting both contribute to shielding this proposed development from the farmsteads and the road. Most farmsteads are surrounded by shade trees while the road accommodates mainly local traffic and is not very busy. The visual nature of the landscape would continue, but in a slightly modified way. The significance of the visual impact has been assessed as low.

### Social impact

The overall **social** and socio-economic impact in terms of positive and negative impacts is likely to be of a **medium to low significance** during both the construction and operational phases with the implementation of enhancement/mitigation measures. The potential negative impacts associated with the construction phase are typical of construction-related activities and are expected to respond to the mitigation measures proposed. Issues identified include the influx of outside workers, whether locals would be employable during the construction phase of the project as on-site skills development and training would be imperative to ensure that the benefits of employment could be maximised, the intrusion impacts associated with construction, and impacts on the daily living and movement patterns of neighbouring landowners and road users.

The possible job creation and skills development, although limited in extent, are regarded as a significant positive injection into the area. The project would result in significant positive economic spin-offs for the local area and region primarily because of the labour intensive operational practices that would be associated with it.

Based on the findings of the studies undertaken, in terms of environmental constraints and opportunities identified through the Environmental Basic Assessment process, no environmental fatal flaws were identified to be associated with the establishment of the proposed Stella Helpmekaar Solar Energy facility and associated infrastructure.

The significance levels of the majority of identified negative impacts can generally be reduced to acceptable levels by implementing the recommended mitigation measures. With reference to the information available at this planning approval stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as acceptable.

Therefore, it is recommended that the project should be authorised. However, a number of issues requiring mitigation have been highlighted in the impact assessment (Appendix F). In response to these potential environmental impacts, environmental specifications for the management of these issues / impacts are detailed within the

draft Environmental Management Programme (EMPr) included within Appendix G.

### **No Go Alternative (Compulsory)**

Also referred to as the 'Do nothing' option, this refers to Bluewave Capital not constructing the proposed solar energy facility on the identified site. In this scenario the potential positive and negative environmental and social impacts as described in this Basic Assessment Report will not occur and the status quo (which is marginal crop farming) will be maintained.

The following is relevant:

- » The land use of the site would not be optimised for electrical infrastructure which already characterises a section of the farm affected by the proposed development.
- » The do nothing option will not have impacts on the heritage environment.
- » The do nothing alternative will result in no visual impact.
- » The do nothing alternative could potentially result in negative social impacts.

Should the project not proceed, the contribution of approximately 5 MW from this project towards the Government target for renewable energy will not be realised. As a result the potential local and regional socio-economic and environmental benefits expected to be associated with the proposed project would not be realised. These include:

- » **Local need:** A 5MW solar PV electricity generating facility feeding directly into the Edwardsdam Substation will alleviate a significant portion of the capacity burden currently experienced at the Substation. Furthermore this 5MW generation facility will ensure grid stability in this remote part of the country, prone to brown and blackouts.
- » **Increased energy security:** The current electricity crisis in South Africa highlights the significant role that renewable energy can play in terms of power supplementation. In addition, given that renewables can often be deployed in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality, while reducing expensive transmission and distribution losses.
- » **Exploitation of South Africa's significant renewable energy resource:** At present, valuable national resources including biomass by-products, solar radiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio.
  - \* Pollution reduction: The releases of by-products through the burning of fossil fuels for electricity generation have a particularly hazardous impact on human health and contribute to ecosystem degradation.
  - \* Support for international agreements: The effective deployment of renewable

energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under the Kyoto Protocol, and for cementing its status as a leading player within the international community.

- \* Employment creation: The sale, development, installation, maintenance, and management of renewable energy facilities have significant potential for job creation in South Africa.
- \* Acceptability to society: Renewable energy offers a number of tangible benefits to society including reduced pollution concerns, improved human, and ecosystem health.
- \* Support to a new industry sector: The development of renewable energy offers the opportunity to establish a new industry within the South African economy.
- \* Support to local community: Since the local community will acquire some ownership in the facility, some of the revenue generated by the facility will be utilised for upliftment of the local community.

Within a policy framework, the development of renewable energy in South Africa is supported by the White Paper on Renewable Energy (November 2003), which has set a target of 17MW renewable energy contributions to final energy generation mix by 2030. The target is to be achieved primarily through the development of solar, biomass, solar and small-scale hydro.

The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy. Given South Africa's position as one of the highest per capita producer of carbon emissions in the world, this would represent a High negative social cost.

The no-development option also represents a lost opportunity in terms of the employment and business opportunities (construction and operational phase) associated with the proposed solar energy facility. This also represents a negative social cost. On a local level, should the development proceed, the landowner will benefit from the proposed development financially. The study area is not suitable for cultivation and therefore the landowner will not be able to benefit agriculturally. The no-development option will therefore not be beneficial to the landowner or the broader community.

The 'Do nothing' alternative is, therefore, not a preferred alternative.

## SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES ✓

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

There are no insurmountable environmental or social constraints that prevent the establishment of the proposed Stella Helpmekaar Solar Energy Facility. All impacts associated with the proposed 5MW PV facility (including associated infrastructure) and the two power line Route Alternatives have been assessed to be of low significance.

The construction of the proposed solar energy facility should be implemented according to the EMPr to adequately mitigate and manage potential impacts associated with construction activities. The construction activities and relevant rehabilitation of disturbed areas should be monitored against the approved EMPr, the Environmental Authorisation and all other relevant environmental legislation. Relevant conditions to be adhered to include:

### **Preferred alternative:**

It is recommended that power Line Route Alternative 1 be selected as the preferred route alternative (aligned with existing farm road and R377, and thereby consolidating linear infrastructure) in order to minimise the potential ecological and agricultural impacts that are of higher significance along Route Alternative 2.

### **Design, Construction, and Decommissioning Phases:**

- » All relevant practical and reasonable mitigation measures detailed within this report and the specialist reports contained within Appendix D must be implemented.
- » The draft Environmental Management Programme (EMPr) as contained within Appendix G of this report should form part of the contract with the Contractors appointed to construct and maintain the proposed solar energy facility, and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for all life cycle phases of the proposed project is considered to be key in achieving the appropriate environmental management standards as detailed for this project.

- » Temporary laydown areas should be located within identified previously transformed areas or disturbed areas. These areas should be rehabilitated after use.
- » Limited hazardous materials should be stored on site. Any accidental chemical, fuel and oil spills that occur at the site during preconstruction should be cleaned up in the appropriate manner as related to the nature of the spill.
- » No unattended open excavations, holes or pits should be left on site for extended periods as fauna can fall in and become trapped.
- » Any soil disturbance required for preconstruction exploration activities should be rectified after the appropriate measurements have been made.
- » To minimise the soil erosion hazard the following factors need to be addressed (i) to maintain a healthy soil cover between the solar arrays, specifically a good grass cover, and (ii) to employ conservation practices similar to the conservation cultivation when planning the arrangement of the PV arrays, i.e. in strips of land on the contour of the land, with buffer zones of grass between the development strips and the channelling of run-off water from the development strips into stable grass covered waterways or outlets.
- » Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.
- » Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).
- » Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works. If necessary, an ecologist should be consulted to assist or give input into rehabilitation specifications.
- » Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as a when required.
- » An application for all other relevant permits (e.g. those with respect to protected tree species or protected plant species) must be obtained from the relevant authority prior to the commencement of construction activities.
- » All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983), the implementation of a monitoring programme in this regard is recommended.

#### **Operation Phase:**

The mitigation and management measures previously listed in this Basic Assessment Report should be implemented in order to minimise potential environmental impacts. The following mitigation measures should also be implemented.

- » Maintenance of erosion control measures
- » Development and implementation of a stormwater management plan.
- » On-going maintenance of the facility to minimise the potential for visual impacts.
- » On-going monitoring of the site to detect and restrict the spread of alien plant

species.

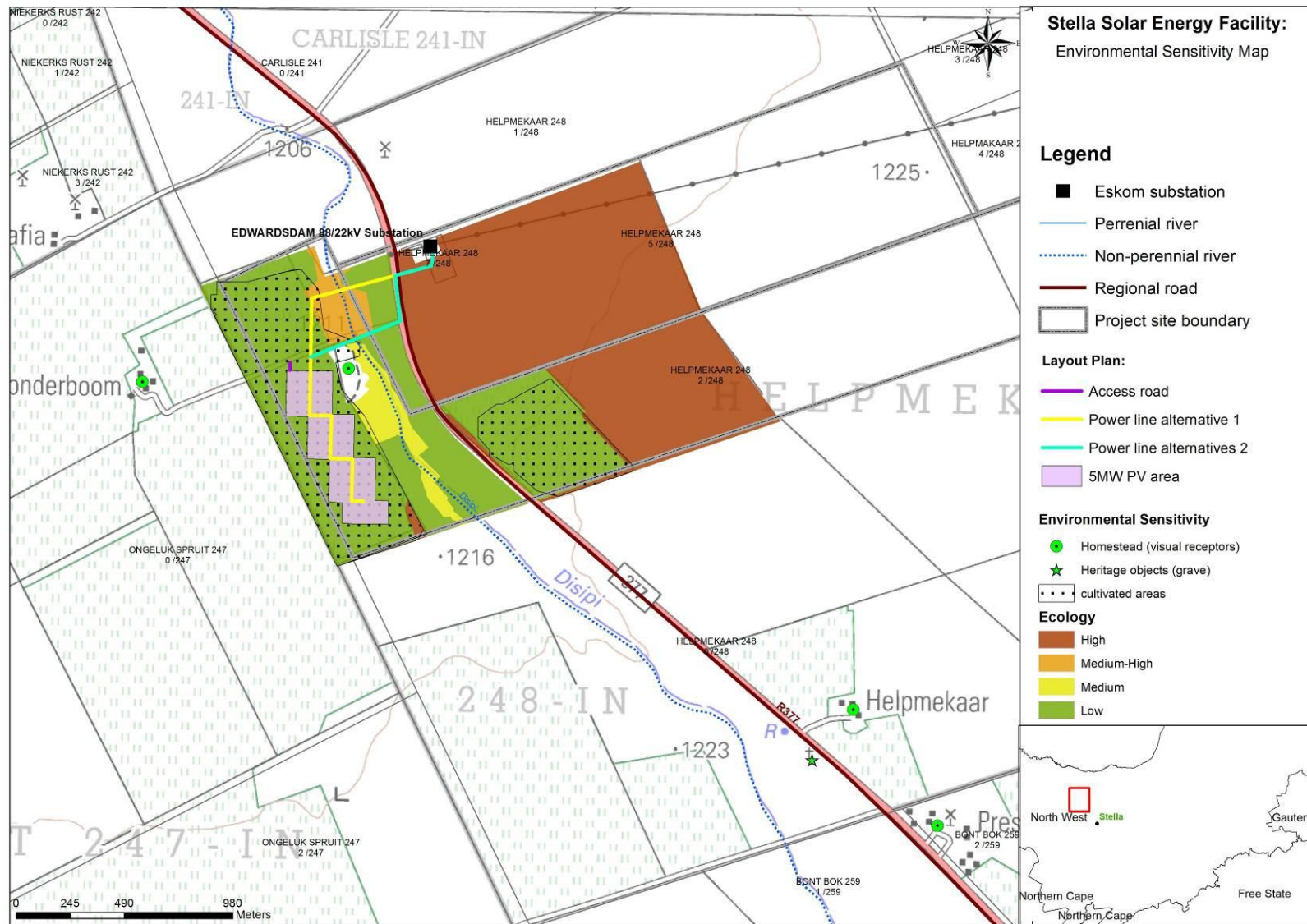
- » Training, skills development and the use of local labour.

Is an EMPr attached?

YES ✓

The EMPr must be attached as **Appendix G**.





**Figure 8:** Environmental sensitivity map of the proposed Stella Helpmekaar Solar Energy Facility

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as **Appendix H**.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in **Appendix I**.

Any other information relevant to this application and not previously included must be attached in **Appendix J**.

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NAME OF EAP

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SIGNATURE OF EAP

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DATE

## **SECTION F: APPENDICES**

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest (in specialist report)

Appendix J:CVs