

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
FINAL BASIC ASSESSMENT REPORT

PROPOSED SENEKAL 2 SOLAR ENERGY FACILITY NEAR
MKUZE, KWAZULU-NATAL
(DEA REF No: 14/12/16/3/3/1/1227)

FINAL BASIC ASSESSMENT REPORT
SUBMITTED TO DEA
SEPTEMBER 2014

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environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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File Reference Number:

Application Number:

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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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14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

PROJECT DETAILS

DEA Reference No.	:	14/12/16/3/3/2/1227
Title	:	Environmental Basic Assessment Process <u>Final</u> Basic Assessment Report: Proposed Senekal 2 Solar Energy Facility Near Mkuze, KwaZulu-Natal
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Client	:	Building Energy SpA
Report Status	:	<u>Final Basic Assessment Report Submitted to DEA</u>

When used as a reference this report should be cited as: Savannah Environmental (2014)
Final Basic Assessment Report: Proposed Senekal 2 Solar Energy Facility Near Mkuze, KwaZulu-
Natal

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SUMMARY AND OVERVIEW OF THE PROPOSED PROJECT

Building Energy SpA, an Independent Power Producer (IPP), is proposing the establishment of a small-scale commercial solar energy facility (using photovoltaic technology) of approximately 5MW in capacity. The site is located approximately 2km west of Mkuze on the Remainder of the Farm Harlingen 13433, in KwaZulu-Natal (refer to Figure 1). The proposed project will be referred to as the **Senekal 2 Solar Energy Facility**.

The purpose of the project is to generate electricity for export into the national electricity grid. **The project forms part of the Department of Energy's (DoE) Small Projects Renewable Energy Independent Power Producer Procurement (REIPPP) Programme and has received First Stage One approval in this bidding programme, and requires environmental authorisation in order to be bidded in the next DoE Small Projects REIPPP round in November 2014.** 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 10ha in extent within which the following infrastructure will be established:

- » Arrays of photovoltaic (PV) panels with a capacity of up to 5MW.
- » Mounting structures to support the PV panels.
- » Cabling between the project components, to be laid underground.
- » Inverters/transformer enclosures.
- » An on-site switching station.
- » An overhead power line of approximately 500m in length to connect to the existing Mkuze Substation
- » Internal access roads.
- » Fencing and workshop area for maintenance and storage, and an on-site office.

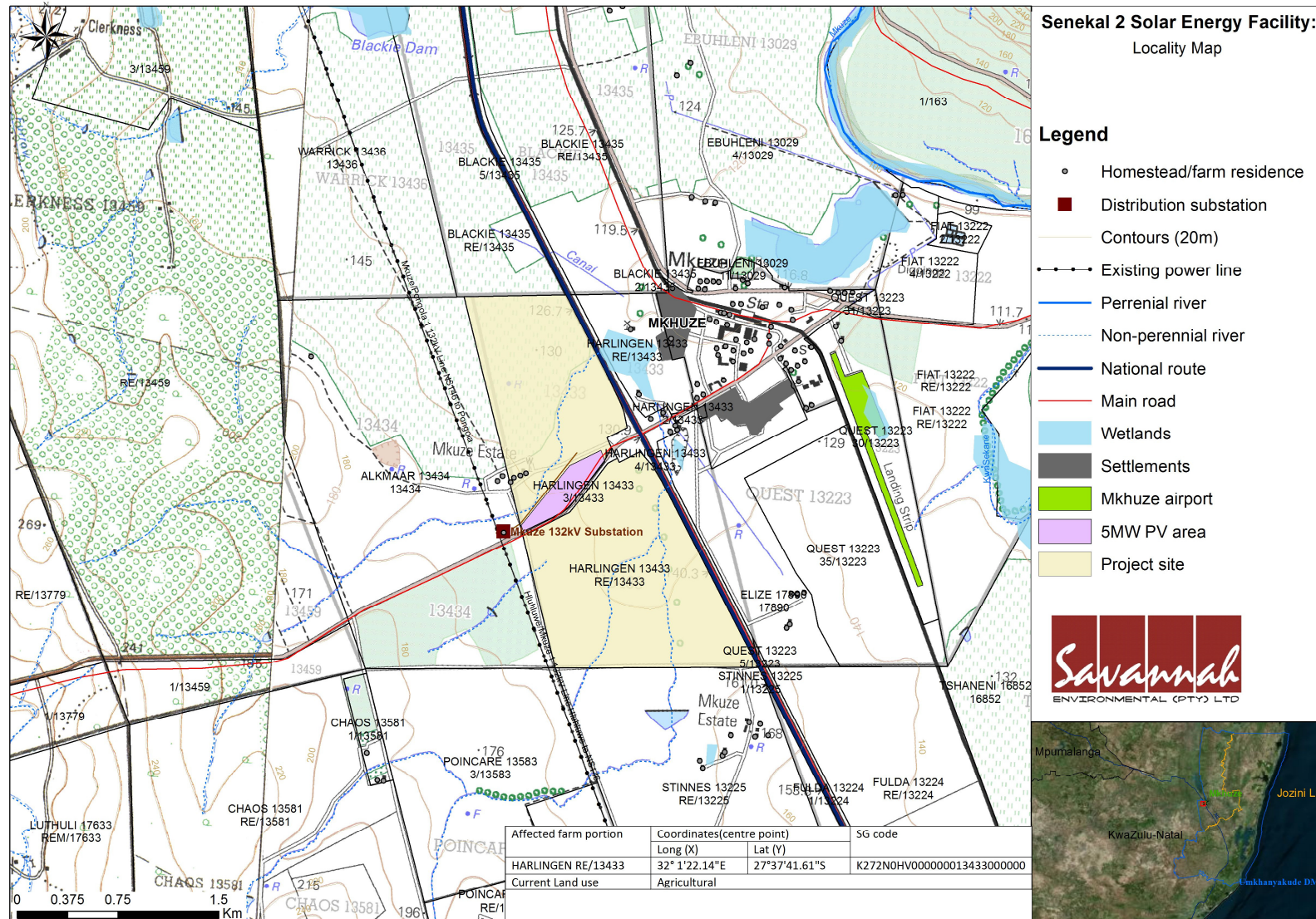


Figure 1: Locality map showing the development area for the proposed Senekal 2 Solar Energy Facility on the Remainder of the Farm Harlingen 13433

1.1 NEED FOR THE PROPOSED DEVELOPMENT

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 BENEFITS OF THE PROPOSED PROJECT

Internationally there is increasing pressure on countries to increase their share of renewable energy generation due to concerns such as climate change and exploitation of resources. The South African Government has set a target for renewable energy of 17 GW all new installed generating capacity (new build) being derived from renewable energy forms, to be produced mainly from biomass, wind, solar and small-scale hydro.

Through pre-feasibility assessments and research, the viability of establishing a 5MW solar energy facility on a site near Mkuze in the KwaZulu-Natal Province has been established by **Building Energy SpA**. The positive implications of establishing a solar energy facility on the demarcated site within the KwaZulu-Natal include:

- » The project would assist the South African government in reaching their set targets for renewable energy.
- » The potential to harness and utilise good solar energy resources would be realised.

- » The National electricity grid in the KwaZulu-Natal would benefit from the additional generated power.
- » Promotion of clean, renewable energy in South Africa.
- » Creation of local employment and business opportunities for the area.

The proposed development represents an investment in clean, renewable energy infrastructure, which, given the challenges created by climate change, represents a positive social benefit for society as a whole. The proposed project will not consume energy, but will instead provide a new source of clean, renewable electricity to the South African power grid. This generation of renewable power will aid in reducing the dependency on other power generation fuels and enhancing the reliability of the regional energy supply.

1.3 REQUIREMENT FOR A BASIC 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, in consultation with the KwaZulu-Natal Department Agriculture, Environmental Affairs and Rural Development (DAEA) 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 for authorisation has been submitted to the DEA. The following listed activities are relevant to the proposed project:

Notice Number	Activity	Description	Relevance of Regulation to Project
GN 544, 18 June 2010	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 facility will have an export capacity of up to 5MW and will be constructed over an area of ~10ha.
GN 544, 18 June 2010	10 (i)	The construction of facilities or infrastructure for the transmission and distribution of electricity- (i). outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kV	A distribution substation and power line will be constructed in order to connect the facility into the national grid outside of urban areas or industrial complexes.
GN 544, 18 June	11 (x) (xi)	The construction of : (x) buildings exceeding 50 square	The construction of the proposed

Notice Number	Activity	Description	Relevance of Regulation to Project
2010		metres in size; or (xi). infrastructure or structures covering 50 square metres or more Where such construction occurs within a watercourse or within a 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	solar energy facility and associated infrastructure will occur within a watercourse or within 32 metres of the edge of a watercourse covering an area of approximately 50 square metres.
GN 544, 18 June 2010	18 (i)	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from: (i) a watercourse	The proposed solar energy facility and associated infrastructure will require infilling or depositing of materials within a watercourse.
GN 544, 18 June 2010	23(ii)	The transformation of undeveloped, vacant or derelict land to- i. 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 proposed solar energy facility will be developed in an area of approximately 10 ha in extent where land will be transformed from its current state into a solar energy facility (industrial).
GN 546, 18 June 2010	4 (a) (ii) (ee) (gg)	The construction of a road wider than 4 metres with a reserve less than 13.5 metres (a). KwaZulu Natal Province ii. Outside urban areas in: (ee). critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans (gg). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve	The proposed solar energy facility and associated infrastructure will require the establishment of new roads wider than 4 meters outside of urban areas near the Pongola Nature Reserve (critical biodiversity area and protected area).
R. 546, 18 June 2010	10 (a) (ii) (ee) (gg)	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such	The proposed solar energy facility and associated infrastructure will require the storage of dangerous goods such

Notice Number	Activity	Description	Relevance of Regulation to Project
		<p>storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres</p> <p>(a). KwaZulu Natal Province</p> <p>(ii). Outside urban areas, in:</p> <p>(ee). critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</p> <p>(gg). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve</p>	<p>as diesel where the capacity will not exceed 80 cubic metres near the Pongola Nature Reserve (critical biodiversity area and protected area).</p>
<p>GN 546, 18 June 2010</p>	<p>13 (a) (c) (ii) (ff)</p>	<p>The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation</p> <p>(a). Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority</p> <p>(c). KwaZulu Natal Province</p> <p>(ii). Outside urban areas, in:</p> <p>(ff). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve</p>	<p>The proposed solar energy facility and associated infrastructure will require the clearance of vegetation where 75% or more may constitute indigenous vegetation near the Pongola Nature Reserve (critical biodiversity area and protected area).</p>
<p>GN 546, 18 June 2010</p>	<p>14 a (i)</p>	<p>The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation</p> <p>(a) In KwaZulu-Natal</p> <p>i) All areas outside urban areas</p>	<p>The solar energy facility will be located outside urban areas and will require the clearance of natural vegetation.</p>
<p>GN 546, 18 June 2010</p>	<p>16 (iii) (iv) (a) (ii) (ff) (hh)</p>	<p>The construction of:</p> <p>(iii). buildings with a footprint exceeding 10 square metres in size; or</p> <p>(iv). infrastructure covering 10 square metres or more</p>	<p>The proposed solar energy facility and associated infrastructure will impede upon watercourses or within 32 metres of a near the Pongola Nature</p>

Notice Number	Activity	Description	Relevance of Regulation to Project
		<p>Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse</p> <p>(a). KwaZulu Natal Province</p> <p>(ii). Outside urban area, in:</p> <p>(ff). critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</p> <p>(hh). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve</p>	<p>Reserve (critical biodiversity area and protected area).</p>
<p>GN 546, 18 June 2010</p>	<p>19 (a) (ii) (ee) (gg)</p>	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>(a) KwaZulu Natal province</p> <p>(ii) Outside urban area, in:</p> <p>(ee) critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve</p>	<p>The proposed solar energy facility and associated infrastructure will require the widening or lengthening of existing roads to access the site in a near the Pongola Nature Reserve (critical biodiversity area and protected area).</p>

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 any 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.

1.4 DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER AND EXPERTISE TO CONDUCT THE BASIC ASSESSMENT PROCESS

Savannah Environmental was contracted by Building Energy 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 Building Energy. 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:

- » *Sheila Muniongo* - the principle author of this report holds an Honours Bachelor degree in Environmental Management and 3 and half years of experience in the environmental field. Her key focus is on environmental impact assessments, public participation, environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several EIAs for renewable energy projects across the country.
- » *Karen Jodas* - the principle Environmental Assessment Practitioner (EAP) for this project, is a registered Professional Natural Scientist and holds a Master of Science degree. She has 17 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:

Specialist Studies Undertaken	Specialists
Ecology (aquatic & terrestrial) Impact Assessment	Brian Colloty of Scherman Colloty & Associates
Soil and Agricultural Potential Impact Assessment	Johann Lanz of Johann Lanz Soil Scientist
Heritage Impact Assessment	Jaco van der Walt of Heritage Contracts and Archaeological Consulting
Palaeontology Desktop Study	Dr Barry Millsted of BM Geological Services
Social Impact Assessment	Candice Hunter of Savannah Environmental

CVs for the project team are included in **Appendix H**.

FINAL BASIC ASSESSMENT REPORT SUBMITTED TO DEA

This Final Basic Assessment Report has been prepared by Savannah Environmental in order to assess the potential environmental impacts associated with the **Senekal 2 Solar Energy Facility**.

The draft Basic Assessment report was available for a 30-day period for review from **05 August 2014 –04 September 2014** at the following locations:

- » Umkhanyakude District Municipality – Harlingen No. 13433, Kingfisher Road, Mkuze.
- » www.savannahSA.com

As required in terms of Regulation 56(3), this final Basic Assessment Report has been made available to registered interested and affected parties for comment and has also been submitted to DEA. I&APs have been advised to submit any additional comments directly to DEA with a copy submitted to Savannah Environmental in accordance with Regulation 56(6).

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

a) Describe the project associated with the listed activities applied for

Building Energy SpA is proposing the development of a small-scale photovoltaic solar energy facility ~2km west of Mkuze in KwaZulu-Natal. The project is referred to as the proposed **Senekal 2 Solar Energy Facility**. The facility is proposed to be located on the Remainder of Harlingen 13433 and have a generating capacity of up to 5MW and a development footprint of approximately 10ha in extent.

The solar energy facility will include the following typical infrastructure:

- » Arrays of photovoltaic (PV) panels with a capacity of up to 5MW.
- » Mounting structures to support the PV panels.
- » Cabling between the project components, to be lain underground.
- » Inverters/transformer enclosures.
- » An on-site switching station.
- » An overhead power line of approximately 500m in length to connect to the existing Mkuze Substation
- » Internal access roads.
- » Fencing and workshop area for maintenance and storage and an on-site office.

An estimated 1 300 m³ of water would be required for the construction of the PV facility and approximately 500 m³ of water per annum will be required for the cleaning of the PV panels during operation. Water will be trucked from the nearest licenced water user, Jozini Local Municipality. In addition to standard water use for an office and toilets during the operational phase, the PV panels may need to be cleaned occasionally. Two cleaning events per year are estimated which should accommodate dust storm events and regular cleaning.

The overall aim of the design and layout of the facility is to maximise electricity production through exposure to the solar radiation, while minimising infrastructure, operation and maintenance costs, and social and environmental impacts. The use of solar energy for power generation can be described as a non-consumptive use of natural resources which emits no greenhouse gas emissions during the electricity generation process. The generation of renewable energy will contribute to South Africa's electricity generating market which has historically been dominated by coal-

based power generation.

The purpose of the project is to generate electricity for export into the national electricity grid. The project will participate in the Department of Energy's Small Projects Renewable Energy Independent Power Producer Procurement Programme (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.

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 (as illustrated in Figure 2). 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: Illustration of PV arrays

A single cell is sufficient to power a small device such as an emergency telephone. However, to produce 5MW 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 (see Figure 3). 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° 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.

Tracking PV System

Tracking PV Systems (single axis or dual axis trackers) are fixed to mountings which track the sun's movement. There are various tracking systems (see example in Figure

4). 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 more complex technology, which may include solar irradiation sensors to optimise the exposure of PV panels to sunlight. Tracking PV panels follow the sun's rotational path all day, every day of the year giving it the best solar panel orientation and thereby enabling it to generate the maximum possible output power.

Fixed Mounted PV System technological is considered for the proposed Senekal 2 Solar Facility, the PV panels are designed to operate continuously for more than 20 years, unattended and with low maintenance.



Figure 4: Illustration of tracking PV technology panels

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 inverter that Building Energy SpA intends to use on the project is shown in Figure 5 and has a footprint of 9 by 3 meters and is typically 3 meters high. These are usually bolted to a concrete pad similar in size to the inverter.



Figure 5: Image of a typical inverter proposed for the project.

2. Overview of the Construction Phase

A facility consisting of several PV arrays with a generating capacity of 5MW could take approximately 8-12 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

The identified site is accessible via an existing gravel access road, via an existing gravel access road, off the N2. The site is therefore appropriately located for easy transport of components and equipment as well as labour movement to and from 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 required for the switching station) 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).

Establishment of Laydown Areas on Site

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

Erect PV Cells and Construct Substation & Inverters

The PV panels will be arranged in arrays. The height of the PV panel structure will be up to 4m. The frames may be fixed onto the ground with the use of concrete, depending on the soil conditions at the site. An overhead power line of approximately 500m in length to tie into the Mkuze Substation located adjacent to the site.

Inverters and PV plant transformer/substation will be installed to facilitate the connection between the solar energy facility and the Eskom electricity grid. Connection will be dependent on final engagement with Eskom, but it is expected to be via the Mkuze Substation located adjacent to PV site. 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, office and 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 switching station substation. Thereafter energy

will be transmitted via an overhead power line into the Mkuze Substation located adjacent to PV site

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 m³ 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 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 site will be rehabilitated and can be returned to the current or other beneficial land-use.

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

The following listed activities are relevant to the proposed development:

Notice Number	Activity	Description	Relevance of Regulation to Project
GN 544, 18 June 2010	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 facility will have an export capacity of up to 5MW and will be constructed over an area of ~10ha.
GN 544, 18 June 2010	10 (i)	The construction of facilities or infrastructure for the transmission and distribution of electricity- (i). outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kV	A distribution substation and power line will be constructed in order to connect the facility into the national grid outside of urban areas or industrial complexes.
GN 544, 18 June 2010	11 (x) (xi)	The construction of : (x) buildings exceeding 50 square metres in size; or (xi). infrastructure or structures covering 50 square metres or more Where such construction occurs within a watercourse or within a 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	The construction of the proposed solar energy facility and associated infrastructure will occur within a watercourse or within 32 metres of the edge of a watercourse covering an area of approximately 50 square metres.
GN 544, 18 June 2010	18 (i)	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from: (i) a watercourse	The proposed solar energy facility and associated infrastructure will require infilling or depositing of materials within a watercourse.
GN 544, 18 June 2010	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	The proposed solar energy facility will be developed in an area of approximately 10 ha in extent where land will be transformed from its current state into a solar energy facility.

Notice Number	Activity	Description	Relevance of Regulation to Project
		area to be transformed is bigger than 1 hectare but less than 20 hectares.	
GN 546, 18 June 2010	4 (a) (ii) (ee) (gg)	The construction of a road wider than 4 metres with a reserve less than 13.5 metres (a). KwaZulu Natal Province ii. Outside urban areas in: (ee). critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans (gg). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve	The proposed solar energy facility and associated infrastructure will require the establishment of new roads wider than 4 meters outside of urban areas near the Pongola Nature Reserve (critical biodiversity area and protected area).
R. 546, 18 June 2010	10 (a) (ii) (ee) (gg)	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres (a). KwaZulu Natal Province (ii). Outside urban areas, in: (ee). critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans (gg). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve	The proposed solar energy facility and associated infrastructure will require the storage of dangerous goods such as diesel where the capacity will not exceed 80 cubic metres near the Pongola Nature Reserve (critical biodiversity area and protected area).
GN 546, 18 June 2010	13 (a) (c) (ii) (ff)	The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation (a). Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent	The proposed solar energy facility and associated infrastructure will require the clearance of vegetation where 75% or more may constitute indigenous vegetation near the Pongola Nature Reserve (critical biodiversity area and protected area).

Notice Number	Activity	Description	Relevance of Regulation to Project
		<p>authority</p> <p>(c). KwaZulu Natal Province</p> <p>(ii). Outside urban areas, in:</p> <p>(ff). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve</p>	
GN 546, 18 June 2010	14 a (i)	<p>The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation</p> <p>(a) In KwaZulu-Natal</p> <p>i) All areas outside urban areas</p>	The solar energy facility will be located outside urban areas and will require the clearance of natural vegetation.
GN 546, 18 June 2010	16 (iii) (iv) (a) (ii) (ff) (hh)	<p>The construction of:</p> <p>(iii). buildings with a footprint exceeding 10 square metres in size; or</p> <p>(iv). infrastructure covering 10 square metres or more</p> <p>Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse</p> <p>(a). KwaZulu Natal Province</p> <p>(ii). Outside urban area, in:</p> <p>(ff). critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</p> <p>(hh). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve</p>	The proposed solar energy facility and associated infrastructure may impede upon watercourses or within 32 metres of a near the Pongola Nature Reserve (critical biodiversity area and protected area).
GN 546, 18 June 2010	19 (a) (ii) (ee) (gg)	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p>(a). KwaZulu Natal province</p> <p>(ii). Outside urban area, in:</p> <p>(ee). critical biodiversity areas as</p>	The proposed solar energy facility and associated infrastructure will require the widening or lengthening of existing roads to access the site in a near the Pongola Nature

Notice Number	Activity	Description	Relevance of Regulation to Project
		identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans (gg). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve	Reserve (critical biodiversity area and protected area).

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 Extent - space is an important factor for the development of a PV facility. An area of approximately 10ha would be required for the 5MW facility. The proposed site, the Remainder of Farm Harlingen 13433, with a total area of ~300ha, will therefore be sufficient for the installation of the proposed facility, and will allow 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 is available for lease by the developer for the proposed development. The identified site is accessible off the rural Provincial Main Road P234. This road is aligned in an east-west direction, crossing the N2. The site is therefore appropriately located for easy 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 slope of the proposed site is less than 3%, which reduces the need for extensive earthworks and associated levelling activities, thereby minimising environmental impacts. The site is therefore considered to be acceptable from a development perspective.

Grid Connection - Grid connection is optimized due to the positioning of the facility to the Mkuze Substation approximately 500m from the solar energy facility site, allowing for a short grid connection.

Environmental considerations: The PV site is situated within an area classified as a CBA 1 Mandatory (highest order CBA) and therefore no alternatives in the province exist

for meeting conservation targets of sensitive features mapped in terms of the KZN Systemic Conservation Plan. The study area was characterised as Irreplaceable, which is largely due to the habitat being preferred by Black Rhino. Several other plants, mammals and insects also with conservation concern utilise this habitat, which has increased the value of the region. The environmental screening study that was undertaken concluded that the development of the 5MW Senekal 2 Solar Energy Facility is potentially compatible with the adjacent land use being an authorised power generation facility (i.e. biomass plant), an existing substation and a number of transmission power lines that are present in the area.

Taking the above into consideration, this area was identified as being the most ecologically suitable option at the project screening phase due to the proximity to the existing infrastructures within the area and the need for avoidance of potential environmental impacts on other areas of the site further from the these infrastructures. The proposed site was identified by the proposed developer as being technically feasible.

Alternative 1 (preferred alternative)		
<p>The proposed Senekal 2 Solar Facility is expected to have a development footprint (~10ha) which is smaller than the broader site area (~300ha). Therefore the facility and associated infrastructure (i.e. PV panels, internal roads, etc.) can be appropriately located to avoid sensitive areas within the broader study area. The environmental screening study that was undertaken concluded that the development of the 5MW Senekal 2 Solar Energy Facility is potentially compatible with the adjacent land use being an authorised power generation facility (i.e. biomass plant) and existing substation. In addition, various power lines are present in the area.</p> <p>This area was identified as being the most ecologically suitable option at the project screening phase due to the proximity to the existing substation and the need for avoidance of potential environmental impacts on other areas of the site further from the substation. No site alternatives for the 5MW PV area are provided for assessment.</p>	<p>Lat 27°37'44.86"S</p>	<p>Long 32° 1'15.29"E</p>

Alternative 2		
Alternative 3		
Alternative 4		

In the case of linear activities:

The co-ordinates for the power line of suitable voltage to connect into the existing Mkuze Substation are provided below:

Power line (~500m)

**Latitude
(S):**

**Longitude
(E):**

• Starting point of the activity	27°	37'	40.29"	32°	1'	14.22"
• Middle/Additional point of the activity	27°	37'	46.97"	32°	1'	8.91"
• End point of the activity	27°	37'	53.31"	32°	1'	0.80"

Alternative S2 (if any)

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

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

Alternative 1 (preferred alternative)		
Description:	Lat (DDMMSS)	Long (DDMMSS)
The proposed Senekal 2 Solar Facility is expected to have a developmental footprint (~10ha) which is smaller than the broader site area (~300ha).	Lat 27°37'44.86"S	Long 32° 1'15.29"E

<p>Therefore the facility and associated infrastructure (i.e. PV panels, internal roads, etc.) can be appropriately located to avoid sensitive areas within the broader study area. The environmental screening study that was undertaken concluded that the development of the 5MW Senekal 2 Solar Energy Facility is potentially compatible with the adjacent land use being an authorised power generation facility (i.e. biomass plant) and existing substation. In addition, various power lines are present in the area.</p> <p>This area was identified as being the most ecologically suitable option at the project screening phase due to the proximity to the existing substation and the need for avoidance of potential environmental impacts on other areas of the site further from the substation. No site alternatives for the 5MW PV area are provided for assessment.</p>		
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Alternative 2

Description	Lat (DDMMSS)	Long (DDMMSS)

Alternative 3

Description	Lat (DDMMSS)	Long (DDMMSS)

c) Technology alternatives

Alternative 1 (preferred alternative)

As it is the intention of Building Energy SpA to develop renewable energy projects as part of the DoE’s Renewable Energy Independent Power Producing Programme (REIPPP), 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). Solar PV was determined as the most suitable option for the proposed site as large volumes of water are not needed for power generation purposes as would be required for concentrated solar power technology (CSP). In addition, PV technology is

considered more feasible from a technical perspective at this scale of development (i.e. 5MW). PV is also preferred when compared to CSP technology because of the lower visual profile.

Very few technological options exist as far as PV technologies are concerned. Those that are available are usually differentiated by weather and temperature conditions that prevail, such that optimality is obtained by the final choice. 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.:

- » Fixed / static PV panels;
- » Tracking PV panels (with solar panels that rotate to follow the sun’s movement); and
- » Concentrated PV Plants (CPV technology).

Fixed technology is being considered for the proposed Senekal 2 Solar Facility. The preferred option will be informed by financial, technical and environmental factors.

Alternative 2

Alternative 3

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

Alternative 1 (preferred alternative)

Operating Alternatives

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.

Alternative 2

Alternative 3

e) No-go alternative

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. This alternative is included as a baseline in this report, against which the project impacts are assessed. This option is assessed as the "no go alternative" in this Basic Assessment Report (Section D and Appendix F).

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 A1¹ (preferred activity alternative)
 Alternative A2 (if any)
 Alternative A3 (if any)

Size of the activity:

~100 000 m ²
m ²
m ²

or, for linear activities:

Alternative:

Alternative A1 (preferred activity alternative)
 Alternative A2 (if any)
 Alternative A3 (if any)

Length of the activity:

m
m
m

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

Alternative: Power Line

Alternative A1 (preferred activity alternative)
 Alternative A2 (if any)
 Alternative A3 (if any)

Size of the site/servitude:

22m
m ²
m ²

4. SITE ACCESS

Does ready access to the site exist?

YES	
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¹ "Alternative A.." refer to activity, process, technology or other alternatives.

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

N/A

Describe the type of access road planned:

The site is located west of both the town of Mkuze and the National Route 2 (N2). Access to the site is off the rural Provincial Main Road P234 (Figure 6). This road is aligned in an east-west direction, crossing the N2, with Bhangano to the west and Mkuze to the east. Where needed, existing roads will be upgraded. Internal roads on the PV site will be constructed by Building Energy SpA to accommodate construction and delivery vehicles. The N2 is a 2-lane freeway with paved shoulders in excess of 2 meters and is aligned in a north-south direction, with Pongola to the north and Empangeni to the south. The N2 serves numerous towns and villages along its length within the UMkhanyakude District Municipality. The P234 intersects the N2, creating a 2-way stop intersection. The P234 is a 2-lane surfaced road on the east of the N2 and a 7m wide gravel road on the west.

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.**



Figure 6: Senekal 2 existing access road (Provincial Main Road P234) off the N2

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 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):

1. Is the activity permitted in terms of the property's existing land use rights?		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.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES ✓		Please explain
The KwaZulu-Natal Provincial Spatial Development Framework (PSDF) has identified that one of the primary Provincial Growth and Development Strategies is to grow the economy and that growing the economy is reliant on the provision of reliable and affordable services by government. Such services include, amongst others, the provision of electricity through the investigation of renewable energy sources. If electricity cannot be provided the economic potential of the province will not be realised. The KZN PSDF recognises that electricity supply is under stress in the province and that this is hindering development in all sectors. Another goal by the Provincial Growth and Development Strategies is to advance alternative energy generation and reduce the reliance on fossil fuels so that a greater proportion of renewable energy is used in KZN. Therefore the proposed project is in line with the KwaZulu-Natal PSDF strategies use by proposing alternative means for energy generation as desired by the KZN PSDF.			
(b) Urban edge / Edge of Built environment for the area	YES ✓		Please explain
The proposed site is located approximately 2km west of the town of Mkuze in KwaZulu-Natal and thus falls outside of the urban edge.			
(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?).	YES ✓		Please explain
According to the Umkhanyakude DM IDP (2012-2013), Improved Service Delivery and Infrastructure Investment and Sustainable Local Economic Development are one of the District Key Performance Areas (KPA). The project will contribute towards growing the local economy, the development of citizens through employment and training provision; it will also facilitate job creation and will introduce new business opportunities to the area.			

<p>The vision of the Jozini LM is to provide sustainable service delivery, socio-economic development and better life for all (Jozini LM IDP 2013-2014). The proposed solar energy facility will contribute towards this vision through development investment in the local area, employment opportunities as well as contribute towards sustainable community through economic growth and development.</p>		
<p>(d) Approved Structure Plan of the Municipality</p>	<p>YES ✓</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>(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?)</p>	<p>NO ✓</p>	<p>Please explain</p>
<p>According to the Umkhanyakude EMF, the areas falls within the Unconserved Terrestrial Biodiversity Zone, these zones are located outside of formally protected parks, and exhibit high biodiversity or supportive functions. According to the KwaZulu-Natal Wildlife Systematic Biodiversity Conservation Plan (KZNSCP), the site occurs within a CBA 1 area, this is largely due to the habitat being preferred by Black Rhino together with other several plants, mammals and insects of Conservation Concern that utilise this habitat, which has increased the value of the region. The results, based on the available information and the site investigations, show that the proposed project could have an impact on the vegetation and intact habitats within the study area. The proposed project might compromise the integrity of the existing environmental management priorities set out by the KZNSCP. However, the proposed activity is potentially compatible with the adjacent land use being an authorised power generation facility (i.e. biomass plant), an existing substation and a number of transmission power lines that are present in the area, these will localised and minimise negative impacts over a larger area.</p>		
<p>(f) Any other Plans (e.g. Guide Plan)</p>	<p>NO ✓</p>	<p>Please explain</p>
<p>According to the Ezemvelo KwaZulu-Natal Wildlife Systematic Biodiversity Conservation Plan (KZNSCP), the PV site is situated within an area classified as a CBA 1 Mandatory (highest order CBA) and therefore no alternatives in the province exist for meeting conservation targets of sensitive features mapped in terms of the KZN Systemic Conservation Plan. A systematic conservation plan was implemented for the Maputaland-Pondoland-Albany Hotspot in order to identify priority areas for conservation. The biodiversity map delineates 72 key biodiversity areas (KBA) and 12 conservation corridors. Of the 72 key biodiversity areas, the study area is located in the Zululand KBA. From the above two conservation plans, it is clear that the project</p>		

is proposed in a high biodiversity value. This is largely due to the habitat being preferred by Black Rhino together with other several plants, mammals and insects of Conservation Concern that utilise this habitat, which has increased the value of the region.

The proposed project might compromise the integrity of the existing environmental management priorities set out by the conservation planning of the area. However, the proposed activity is potentially compatible with the adjacent land use being an authorised power generation facility (i.e. biomass plant), an existing substation and a number of transmission power lines that are present in the area, these will localised and minimise negative impacts over a larger area.

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)?

NO ✓

Please explain

The main purpose of the development is to generate electricity from a renewable 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.




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.)

YES ✓

Please explain

The evacuation of additional power into the Eskom grid, although only 5MW , 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.

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>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.)</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>Existing services provided by the Jozini Local Municipality are of adequate capacity to service the proposed small-scale 5MW PV development.</p> <ul style="list-style-type: none"> • Roads: Access provision from the N2 may result in localised traffic impacts. The cost of any additional access provisions will be carried by the applicant. • Water: The municipality will provide the applicant with confirmation of the availability of water for the construction and operational phases. Approximately 500m³ of water per annum will be required for the cleaning of the PV panels during operation. • 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>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.)</p>		<p>NO ✓</p>	<p>Please explain</p>
<p>The proposed project is to be developed by a private developer (i.e. Building Energy SpA) and not the municipality. It therefore does not fall within the infrastructure planning of the municipality, although the need for the promotion of alternative energy sources is advocated in the municipal IDP. The project will not have any implications for the infrastructure planning of the municipality.</p>			
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	<p>YES ✓</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</p>			

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.

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.)

YES ✓

Please explain

Site Extent - space is an important factor for the development of a PV facility. An area of approximately 10ha would be required for the 5MW facility. The proposed site, the Remainder of Farm Harlingen 13433, with a broader area of ~ 300ha, will therefore be sufficient for the installation of the proposed facility, and will allow 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 is available for lease by the developer for the proposed development. The identified site is accessible via the existing gravel provincial road, off the N2. The site is therefore appropriately located for easy 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 slope of the proposed site is less than 3, which reduces the need for extensive earthworks and associated levelling activities, thereby minimising environmental impacts. The site is therefore considered to be acceptable from a development perspective.

Grid Connection - Grid connection is optimized due to the positioning of the facility to the Mkuze Substation approximately 500m from the solar energy facility, allowing for a short grid connection

Ecological considerations - The PV site is situated within an area classified as a CBA 1 Mandatory (highest order CBA) and therefore no alternatives in the province exist for meeting conservation targets of sensitive features mapped in terms of the KZN Systemic Conservation Plan. The study area was characterised as Irreplaceable, which is largely due to the habitat being preferred by Black Rhino. Several other plants,

<p>mammals and insects also with conservation concern utilise this habitat, which has increased the value of the region. The environmental screening study that was undertaken concluded that the development of the 5MW Senekal 2 Solar Energy Facility is potentially compatible with the adjacent land use being an authorised power generation facility (i.e. biomass plant), an existing substation and a number of power lines that are present in the area, as these will all be localised and minimise negative impacts over a larger area.</p>		
9. Is the development the best practicable environmental option for this land/site?	YES ✓	Please explain
<p>Electrical infrastructure: The Mkuze Substation is located less than 500m adjacent to the proposed PV facility. The immediate area around the proposed PV site is already characterised by a major overhead power line on the west of the site which feeds into the Mkuze Substation and the N2 highway on the east of the site boundary. Therefore the area is already characterised by linear disturbances and electrical infrastructure. In addition, a biomass plant is planned adjacent to the site. The proposed development is therefore not expected to significantly alter the sense of place.</p> <p>Ecological sensitivity: The site is located within a CBA1 (highest order CBA) area as defined by the KZN Conservation Plan. The results, based on the available information and the site investigations, show that the proposed project could have an impact on the vegetation and intact habitats within the study area. However, the proposed activity is potentially compatible with the adjacent land use being an authorised power generation facility (i.e. biomass plant), an existing substation and a number of power lines that are present in the area, as these will all be localised and minimise negative impacts over a larger area.</p>		
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES ✓	Please explain
<p>The negative impacts associated with the proposed activity, as determined through the Basic Assessment process, 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>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</p>		<p>NO ✓</p>	<p>Please explain</p>
<p>There are no PV projects developed as yet within the Jozini Municipality (source: DEAT and CSIR). The proposed development will not set a precedent. The feasibility of any other similar projects would need to be considered on an individual basis. .</p>			
<p>12. Will any person's rights be negatively affected by the proposed activity/ies?</p>		<p>NO ✓</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 to some extent (i.e. visual aspects), however all the land for a considerable extent around the PV site is owned by one landowner. 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 to a lesser extent since the said area is already transformed from mining and industrial activities. Parties who might be interested in or affected by the construction of the facility have been noted to date.</p>			
<p>13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?</p>		<p>NO ✓</p>	<p>Please explain</p>
<p>The proposed site is located approximately 2km west of the town of Mkuze in KwaZulu-Natal and thus falls outside of the urban edge. The project will not undermine the urban edge in any way.</p>			
<p>14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?</p>	<p>YES ✓</p>		<p>Please explain</p>
<p>In 2010, a National Development Plan was drafted to address socio economic issues affecting development in South Africa. These issues were identified and placed under 18 different Strategic Integrated Projects (SIPs) to address the spatial imbalances of the past by addressing the needs of the poorer provinces and enabling socio-economic development. Amongst these is the green energy in support of South African Economy i.e. SIP 8. The SIP aims at supporting sustainable green energy initiatives on national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP, 2010). In fulfilment of SIP 8 (green energy) and to meet the targets set in the Integrated Resource Plan (IRP 2010), the Department of Energy has introduced the REIPPP Programme, which is now in its fourth year.</p> <p>The proposed Senekal 2 Solar Energy Facility could potentially contribute towards SIP 8 by addition of clean energy to the grid (should the project become a preferred bidder) and the project will create significant socio-economic benefits at a local, regional and national scale.</p>			
<p>15. What will the benefits be to society in general and to the local communities?</p>	<p>Please explain</p>		
<p>Job opportunities, albeit limited, will be created during the construction and operation</p>			

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.).	
16. Any other need and desirability considerations related to the proposed activity?	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.	
17. How does the project fit into the National Development Plan for 2030?	Please explain
One of the visions for 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.	
18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.	
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.	
19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.	
<p>The principle of environmental management as set out in section of NEMA states that:</p> <ul style="list-style-type: none"> » 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; » Development must be sustainable socially (people), environmentally (planet) and economically (prosperity);and » Sustainable development requires the consideration of all the relevant factors, <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 EMPr would provide mitigation measures in terms of disturbance to ecosystems, loss of biodiversity, pollution and degradation to the environment, waste and stormwater management. 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>	

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 Senekal 2 Solar Energy Facility.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
National Environmental Management Act (Act No 107 of 1998)	<p>The Environmental Assessment 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 GN R543, R544, R545 and R546 of 18 June 2010, a Basic Assessment Process is required to be undertaken for the proposed project.</p>	<p>Department of Environmental Affairs – competent authority</p> <p>KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development (DAEA)</p>	<p>The listed activities triggered by the proposed solar energy facility have been identified and assessed in the Basic Assessment Process being undertaken. This Basic Assessment Report will be submitted to the competent and commenting authority in support of the application for authorisation.</p>
National Environmental Management Act (Act No 107 of 1998)	<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>KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development (DAEA)</p>	<p>While no permitting or licensing requirements arise directly by virtue of the proposed project, this section has found application during the Basic Assessment Process through the consideration of potential impacts (cumulative, direct, and indirect). It will continue to apply throughout the life cycle of the project.</p>
Environment Conservation Act (Act No 73 of 1989)	National Noise Control Regulations (GN R154 dated 10 January 1992)	Department of Environmental Affairs	Noise impacts are expected to be associated with the

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
		KwaZulu-Natal DAEA Jozini Local Municipality	construction phase of the project and are not likely to present a significant intrusion to the local community. On-site activities should be limited to 6:00am - 6:00pm, Monday – Friday (excluding public holidays) and 6:00 am to 1:00pm on Saturdays. Should activities need to be undertaken outside of these times, the surrounding communities will need to be notified.
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 (and then registration of the water use is required). Consumptive water uses may include the taking of water from a water resource - Sections 21a and b. Non-consumptive water uses may include impeding or diverting of flow in a water course - Section 21c; and altering of bed, banks or characteristics of a watercourse - Section 21i.	Department of Water and Sanitation Provincial Department of Water and Sanitation	The water required for this project will be sourced from Jozini Local Municipality. No License would be required from DWA for the taking of water. Should any water resources be impacted through construction, the relevant license would be required to be applied for.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
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.</p> <p>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	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. A Section 53 application to be submitted the DMR Regional office.
Minerals and Petroleum Resources Development Act (Act No 28 of 2002)	<p>A reconnaissance permission, prospecting right, mining right, mining permit, retention permit, technical corporation permit, reconnaissance permit, exploration right and production right work programme; mining work programme, environmental management programme, and environmental management plan may not be amended or varied (including by extension of the area covered by it or by the addition of minerals or a share or shares or seams, mineralised bodies, or strata, which are not at the time the subject thereof) without the written consent of the Minister.</p>	Department of Mineral Resources	DMR were consulted with regard to the proposed facility and due process is underway to obtain permission
National Environmental Management: Air Quality Act (Act No 39 of 2004)	<ul style="list-style-type: none"> » S18, S19 and S20 of the Act allow certain areas to be declared and managed as "priority areas" » Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards » The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with 	Department of Environmental Affairs	<p>No permitting or licensing requirements arise for this facility from this legislation.</p> <p>While no permitting or licensing requirements arise from this legislation,</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>the Act.</p> <p>Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.</p>		<p>this Act will find application during the construction phase of the project.</p> <p>The Air Emissions Authority (AEL) may require the compilation of a dust management plan.</p>
<p>National Heritage Resources Act (Act No 25 of 1999)</p>	<ul style="list-style-type: none"> » Stipulates assessment criteria and categories of heritage resources according to their significance (S7). » Provides for the protection of all archaeological and paleontological sites, and meteorites (S35). » Provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority (S36). » Lists activities which require developers any person who intends to undertake to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development (S38). » Requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction (S44). 	<ul style="list-style-type: none"> » South African Heritage Resources Agency » Amafa Heritage KZN 	<p>A notification letter was submitted to SARHA informing them about the project and request for comments. This Basic Assessment Report together with the heritage study undertaken will also be submitted to SAHRA for review.</p> <p>A permit may be required should any heritage sites be impacted on by the proposed development.</p>
<p>National Environmental Management: Biodiversity Act (Act No 10 of 2004)</p>	<ul style="list-style-type: none"> » Provides for the MEC/Minister to identify any process or activity in such a listed ecosystem as a threatening process (S53) » A list of threatened and protected species has been published in terms of S 56(1) - Government Gazette 29657. » Three government notices have been published, i.e. GN R 150 (Commencement of Threatened and Protected Species Regulations, 2007), GN R 151 (Lists of critically endangered, vulnerable and protected species) and GN R 152 (Threatened or 	<p>Department of Environmental Affairs</p>	<p>Not likely to be required for those areas which have been transformed. A permit will be applied for should there be an impact on any species which are protected or endangered.</p> <p>In addition, a weed control</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>Protected Species Regulations).</p> <ul style="list-style-type: none"> » Provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and 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, GN 1002), 9 December 2011). » This Act also regulates alien and invader species. » Under this Act, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species. 		and management plan must be implemented.
Conservation of Agricultural Resources Act (Act No 43 of 1983)	<ul style="list-style-type: none"> » Prohibition of the spreading of weeds (S5) » Classification of categories of weeds & invader plants (Regulation 15 of GN R1048) & restrictions in terms of where these species may occur. » Requirement & methods to implement control measures for alien and invasive plant species (Regulation 15E of GN R1048). 	Department of Agriculture, Forestry and Fisheries (DAFF)	This Act will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented. In addition, a weed control and management plan must be implemented.
National Forests Act (Act No. 84 of 1998)	According to this Act, the Minister has declared a tree, group of trees, woodland or a species of trees as protected. The prohibitions provide that 'no person may cut, damage, disturb, destroy or	Department of Agriculture, Forestry and Fisheries (DAFF)	There are no protected trees on the site.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister’.		
National Veld and Forest Fire Act (Act 101 of 1998)	<p>In terms of S21 the applicant must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the 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>	Department of Agriculture, Forestry and Fisheries (DAFF)	While no permitting or licensing requirements arise from this legislation, this act will find application during the construction and operational phase of the project.
Hazardous Substances Act (Act No 15 of 1973)	<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 being in force.</p>	Department of Health	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.
National Environmental	The Minister may by notice in the Gazette publish a list of waste	National Department	As no waste disposal site is

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
Management: Waste Act, 2008 (Act No. 59 of 2008)	<p>management activities that have, or are likely to have, a detrimental effect on the environment.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. <p>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.</p> <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"> » The containers in which any waste is stored, are intact and not corroded or in » any other way rendered unfit for the safe storage of waste; » Adequate measures are taken to prevent accidental spillage or leaking; » The waste cannot be blown away; » Nuisances such as odour, visual impacts and breeding of vectors do not arise; and » Pollution of the environment and harm to health are prevented. 	<p>of Water and Environmental Affairs</p> <p>Provincial Department of Environmental Affairs (general waste)</p>	<p>to be associated with the proposed project, no permit is required in this regard.</p> <p>Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act.</p> <p>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).</p>
National Road Traffic Act (Act No 93 of 1996)	<ul style="list-style-type: none"> » 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 	<p>South African National Roads Agency Limited (national roads)</p> <p>Provincial Department</p>	<p>An abnormal load/vehicle permit may be required to transport the various components to site for construction. These</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>procedures to be followed in applying for exemption permits are described and discussed.</p> <ul style="list-style-type: none"> » 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. » 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. 	of Transport	include route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads.
Provincial Legislation & Plans			
KwaZulu-Natal Nature Conservation Management Amendment Act, No. 5 of 1999:	This Act provides the institutional structure for nature conservation in Kwazulu-Natal; to establish control and monitoring body and mechanics, and to provide for matters incidental thereto.	KwaZulu-Natal Department Agriculture, Environmental Affairs and Rural Development (DAEA)	<p>Refer to the Ecology Report - Appendix D1 for a list of species found in the study, although none of these species could be confirmed during the site visit as a result of the site conditions during the survey</p> <p>A permit will be applied for should there be any impact in the species which are in terms of this Act</p>
KwaZulu-Natal Provincial Spatial Development Framework (Draft 2) (2011)	Provides a spatial interpretation of the Provincial Growth and Development Strategy to guide future land use and development	KwaZulu-Natal Department Agriculture, Environmental Affairs	No permitting or licensing requirements.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
		and Rural Development (DAEA)	
KwaZulu-Natal Provincial Growth and Development Strategy 2012-2030 (2012)	Provides a framework for integrated and sustainable growth and economic development for the Province and its people over the next ten years. It addresses the formulation of a common vision, goals and objectives of what should be achieved and how the provincial government and its social partners should achieve its objectives	KwaZulu-Natal Provincial Planning Commission	No permitting or licensing requirements.
KwaZulu-Natal Biodiversity Conservation Assessment Plan (2010)	<ul style="list-style-type: none"> » inform the development of the Provincial Biodiversity Sector plans, bioregional plans, and also be used to inform Spatial Development Frameworks (SDFs), Environmental Management Frameworks (EMFs), Strategic Environmental Assessments (SEAs) and in the Environmental Impact Assessment (EIA) process in the province. 	Ezemvelo KZN Wildlife	No permitting or licensing requirements.
Local Government			
Jozini Local Municipality IDP (2013-2014)	<ul style="list-style-type: none"> » Ensure the provision of services to communities in a sustainable manner » Promote safe and healthy environment 	Local Authorities	No permitting or licensing requirements.

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

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

YES ✓

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

± 8m³ of solid construction waste consisting mainly of vegetation, spoil material from clearing activities and metal and cabling off cuts.

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 disposed of at the nearest licensed municipal landfill site.

Will the activity produce solid waste during its operational phase?

NO ✓

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? m³

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?

	NO ✓

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 is required to adhere to the mitigation measures stipulated in the Environmental Management Programme and the National Dust Control Regulations (1 November 2013) in terms of dust abatement and control.

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?

	NO ✓
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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?

	NO ✓

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):

Municipal ✓	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water
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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?

NO ✓

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

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? YES ✓

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**.

Property description/physical address:

Province	KwaZulu-Natal
District Municipality	Umkhanyakude District Municipality
Local Municipality	Jozini Local Municipality
Ward Number(s)	20
Farm name and number	Harlingen 13433
Portion number	Remainder
SG Code	N0HU00000000077200000

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:

Agricultural

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?

NO ✓

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

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 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 checked="" 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"/>	2.6 Plain	<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?

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	YES ✓	YES NO	YES NO
Dolomite, sinkhole or doline areas	NO ✓	YES NO	YES NO
Seasonally wet soils (often close to water bodies)	YES ✓	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

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Soils with high clay content (clay fraction more than 40%)	YES ✓	YES NO	YES NO
Any other unstable soil or geological feature	NO ✓	YES NO	YES NO
An area sensitive to erosion	NO ✓	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 ^E	Natural veld with scattered aliens^E ✓	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land✓	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an “^E” 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	NO ✓	
Non-Perennial River	YES ✓	
Permanent Wetland	NO ✓	
Seasonal Wetland	NO ✓	

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.

A non-perennial river drainage line runs adjacent to the proposed project site. The development area is however further than 32m from this watercourse.

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:

Natural area ✓	Dam or reservoir	Polo fields
Low density residential ✓	Hospital/medical centre	Filling station ^H
Medium density residential✓	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A	Church	Agriculture ✓
Retail commercial & warehousing (i.e. farm stead)	Old age home	River, stream or wetland ✓
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, koppie or ridge
Heavy industrial ^{AN}	Railway line ^N ✓	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses: 1. An existing power line (Hluhluwe/Mkuze 132kV) runs parallel to the proposed site. 2. Mkuze Substation lies adjacent to the project site on the western side

		<p>3. A biomass plant is proposed on the property to the west of the project site</p> <p>4. The site lies adjacent to the N2 national road.</p>
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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?

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)	YES ✓	
Core area of a protected area?		NO ✓
Buffer area of a protected area?		NO ✓
Planned expansion area of an existing protected area?		NO ✓
Existing offset area associated with a previous Environmental Authorisation?		NO ✓
Buffer area of the SKA?		NO ✓

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

A CBA map is attached within Appendix A .
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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 ✓
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A specialist heritage study was conducted (refer to Appendix D2). No sites were recorded in the study area and due to the lack of shelters, knapping material or features in the landscape, like pans or rocky outcrops, no Stone Age Sites occur. The study area is also located well away from the Tshaneni Battle site and Ndwandwe grave site. A previous HIA study was conducted adjacent to the proposed PV facility and similarly no heritage sites were recorded.

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?		NO ✓
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?		NO ✓

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

PALAEONTOLOGY

The project area is completely underlain by rocks of the Jurassic Letaba Formation. Therefore, a paleontological study was undertaken for the site (refer to Appendix D3).

The Letaba Formation (Lebombo Group) comprises a sequence of picritic (olivine-rich) lavas which form part of the Jurassic Karoo Igneous Province (Duncan and Marsh, 2006). The unit accordingly correlates with part of the Drakensberg Group lavas that terminate the Karoo sedimentation in the Main Karoo Basin. The extrusive, magmatic origins of the rocks that comprise the Letaba Formation preclude the possibility of any fossil materials being present within the unit. Thus, the paleontological potential of the Letaba Formation is assessed as being nil.

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.

Overview:

Jozini has had limited economic development opportunities and in 2011, unemployment rate stood at 44% with total of 12 559 people unemployed and youth unemployment stood at 53%. Jozini Municipality is characterised by high levels of unemployment and poverty. Jozini had a total of 692 (1.8%) households headed by children and 54% of households headed by women. The primary investment points are Mkuze and Jozini; along with Ingwavuma, Ubombo and Bhambanana and serve as the

basis for the developing activities and services such as schools, shops, community halls, etc. Household income is one of the most important determinants of welfare in a region. The ability to meet basic needs, such as adequate food, clothing, shelter and basic amenities, is largely determined by the level of income earned by the households.

Population profile

The population of Jozini showed a slow growth from a total population of 184 206 in 2001 to 186 502 in 2011, and the rate of growth dropped from 2.6% to 0.9%. Black Africans made up 99% of the population and IsiZulu the most commonly spoken home language. The age structure of a population is important for planning purposes. The dependency ratio indicates the amount of individuals that are below the age of 15 and over the age of 64, that are dependent on the Economically Active Population (EAP) (Individuals that are aged 15-64 that are either employed or actively seeking employment- 63.20%).

The population is predominantly youthful, with those aged 14 years and younger making up 41% of the total population– the second highest in the province. The under 20 age group constitutes a significant amount of the population, and those aged between 15 years and 64 years making-up just over half the population (55%) with only 4% of the population 65 years and older. The proportion of potentially economically active persons implies that there is a larger human resource base for development projects to involve the local population. The proportion of women is at 54% while males made up 46% of the total population. This profile is indicative of the mostly male and working-age migration patterns (Source: Jozini Local Municipality).

Economic profile of local municipality:

Jozini has had limited economic development opportunities and in 2011, unemployment rate stood at 44% with total of 12 559 people unemployed and youth unemployment stood at 53%. Jozini Municipality is characterised by high levels of unemployment and poverty. Jozini had a total of 692 (1.8%) households headed by children and 54% of households headed by women. The primary investment points are Mkuze and Jozini; along with Ingwavuma, Ubombo and Bhambanana and serve as the basis for the developing activities and services such as schools, shops, community halls, etc. Household income is one of the most important determinants of welfare in a region. The ability to meet basic needs, such as adequate food, clothing, shelter and basic amenities, is largely determined by the level of income earned by the households.

Standard of living

Jozini Municipality had a total of 38 849 households in 2011 with average household size of 5.3 persons. The proportion of households living in formal dwellings was 76%. The municipality faces many challenges in the provision of infrastructure. The proportion of households with flush toilet connected to sewage was 9.6% and just

10.9% households had piped water inside dwelling and 29.1% households had access to electricity. Jozini ranks as the third lowest in the province in terms of access to electricity and basic services.

Level of education:

Jozini has the 5th highest proportion of people in the province with no schooling (27%). Of those aged between 5 and 24 years, 81% people attended school. Only a quarter 25% had completed matric and just 2.8% had higher education. Although there were high levels of school attendance, very few people progress to tertiary institution or achieve post matric qualification. Those that do would likely migrate to find places of work opportunity. The level of education influences growth and economic productivity of a region. It is clear that low education levels lead to low skills base in an area. Majority of the population have a low-skill level in the municipal area and would either need employment opportunities in low-skill sectors, or better education opportunities in order to improve the skills level of the area, and therefore income levels.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R92.5 million per megawatt.
What is the expected yearly income that will be generated by or as a result of the activity?	To be determined.
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?	To be determined.
What percentage of this will accrue to previously disadvantaged individuals?	Tendering obligations for awarded projects within the REIPPP Programme focus on previously disadvantaged individuals with respect to Small Medium Enterprise (SME) participation, Enterprise Development, Preferential Procurement, Local Content sourcing and BBBEE.
How many permanent new employment opportunities will be created during the operational phase of the activity?	12

What is the expected current value of the employment opportunities during the first 10 years?	To be determined.
What percentage of this will accrue to previously disadvantaged individuals?	2.5

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. 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)

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)✓	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	The study area was characterised as Irreplaceable by the KZN conservation plan, which is largely due to the habitat being preferred by Black Rhino and several other plants, mammals and insects of conservation concern that utilise this habitat, which has increased the value of the region

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (Including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	90%	The site is largely covered by natural vegetation which seems intact with little degradation based on the condition of the surrounding areas, although impacts such as roads, fencing and grazing have impacted the site. The broader study area is dominated by grass (<i>Aristida spp</i>) and <i>Acacia nilotica</i> trees.
Near Natural (includes areas with low to moderate level of alien invasive plants)	0%	
Degraded (includes areas heavily invaded by alien plants)	0%	
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	10%	All the vegetation units observed during the site visit exhibited some degree of degradation due to several roads / tracks and cut lines.

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.

Terrestrial Ecosystems		Aquatic Ecosystems			
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)	Estuary	Coastline	
	Endangered				
	Vulnerable ✓				
	Least Threatened				
		NO ✓		NO ✓	NO ✓

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)

Terrestrial habitats: The study area is characterised by woody grasslands which, according to Mucina and Rutherford (2006), are located within the Zululand Lowveld vegetation type and are listed as Vulnerable. The Biodiversity Act (No 10 of 2004) (Amendment December 2011), lists 225 threatened ecosystems based on vegetation type (Vegmap). This vegetation type, part of the Savanna Biome is listed by this Act as Vulnerable. This according to the SANBI data, is due to the fact this vegetation type is favoured as Black Rhino (KZN 41) habitat within the region. Several of the listed mammal species are found in the Zululand Rhino Reserve (Rhino, Leopard, Lion and Cheetah) south of the site. This reserve is found within the same vegetation type as the study area.

Aquatic environment: A number of watercourses and drainage lines occur adjacent to the site, mostly associated with the Mkuze River and KwaSekane River catchments (Figure 7). However the site itself contained no waterbodies or watercourses and thus has no direct connection with any aquatic environments. According to the National Freshwater Ecosystems Priority Area (NFEPA) wetland data, several natural wetlands occur within the study area. Upon investigation during the site visit these areas were found to be man-made dams, thus artificial systems. The proposed site is shown in Figure 7 in relation to any known waterbodies within the study area.

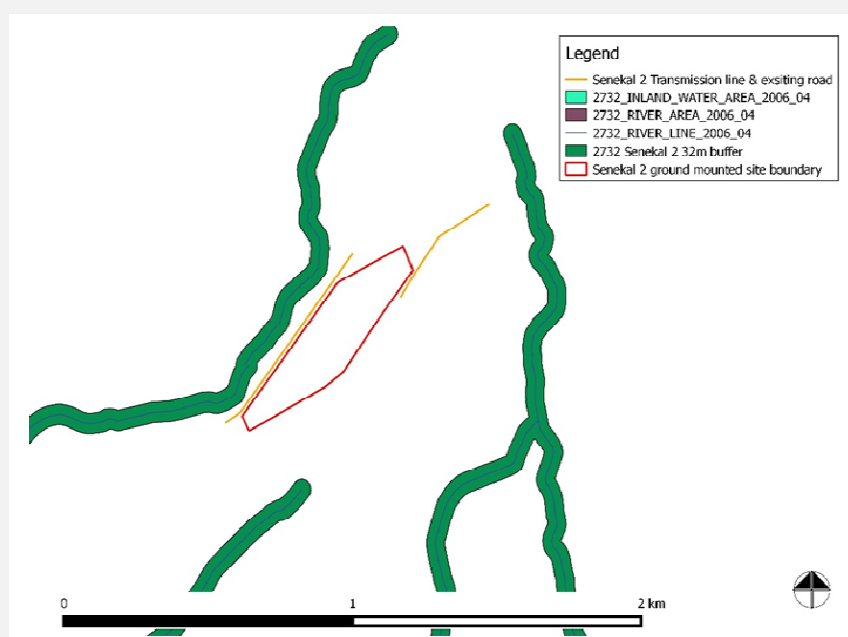


Figure 7: Watercourses with a 32m buffer confirmed within the study area

Biodiversity conservation plans: The study area was characterised as Irreplaceable by the KZN conservation plan, which is largely due to the habitat being preferred by

Black Rhino. Several other plants, mammals and insects of Conservation Concern also utilise this habitat, which has increased the value of the region. The Maputaland-Pondoland-Albany Hotspot (MPAH) spans parts of South Africa, Swaziland and Mozambique. In southern Africa, it is second to the Cape Floristic Region in floristic diversity. A systematic conservation plan was implemented for the Maputaland-Pondoland-Albany Hotspot in order to identify priority areas for conservation. The biodiversity map delineates 72 key biodiversity areas (KBA) and 12 conservation corridors. *Of the 72 key biodiversity areas, the study area is located in the Zululand KBA.*

Species of Conservation Concern (Threatened and / or Protected): A list of potential Species of Conservation Concern was derived from the various databases (SANBI, 2010), which incorporate Threatened species and species listed under the National Biodiversity Act (Refer to the Ecology Report - Appendix D1 – Table 1). A number of trees, protected under the National Forest Act, and some species protected under the provincial legislation, are contained in the listing. Species were mapped according to their location in a Quarter Degree Square (i.e. an area of approximately 30 km by 30 km covered by one 1:50 000 South African topographical map). Those quarter degree squares that overlapped the study area were selected to generate a list of potential Species of Conservation Concern.

None of these species could be confirmed during the site visit as a result of the site conditions during the survey.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICES

Publication name	Zululand Observer	
Date published	28 July 2014	
Site notice position	Latitude	Longitude
	27° 62' 88.7" S	32° 01' 67.3" E
Date placed	26 June 2014	

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:

- » A2 Site notices were placed at the farm entrance gate.
- » A4 Site notices were placed at public places around the project area (i.e. Local Municipality & Library)
- » Adverts were placed in the Zululand Observer (local newspaper) to notify the public of the proposed project.
- » Flyers were distributed to the surrounding landowners and communities.
- » Notification letters sent to identified I&APs
- » Letters sent out to I&APs of the availability of the Draft BAR

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
Impacts of facility on drainage line on site	Ecologist has undertaken an aquatic assessment of the site. It has been concluded that with regards the aquatic environment, no such systems were observed within the site itself habitats. The most sensitive habitats would be the surrounding water courses and although not directly on site, it is recommended that these are avoided with regard new impacts (i.e. road crossings) that could directly surface flows off the site..
Job creation	The project will create approximately 80 jobs during the construction phase and 12 permanent jobs in the operation phase.

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**.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

- » Amafa Heritage KZN
- » Department of Agriculture, Forestry & Fisheries
- » Department of Energy
- » Department of Water Affairs
- » Department of Water Affairs - KwaZulu-Natal
- » Eskom
- » KwaZulu-Natal Department of Agriculture, Environmental Affairs and Rural Development
- » KwaZulu-Natal Department of Transport and Community Safety and Liaison
- » South African Civil Aviation Authority
- » South African Heritage Resources Agency (SAHRA)
- » South African National Roads Agency Limited
- » Square Kilometre Array (SKA): South Africa

- » Jozini Local Municipality
- » Umkhanyakude District Municipality
- » Pongolapoort Nature Reserve (Ezemvelo KZN Wildlife)
- » Umkuze Nature Reserve (Ezemvelo KZN Wildlife)

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**.

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 Senekal 2 Facility is provided in the table overleaf.

Activity	Impact summary	Significance (without - with mitigation)	Proposed mitigation
CONSTRUCTION			
Alternative 1 (preferred alternative): PV facility and associated infrastructure			
Ecological impacts			
Vegetation clearing and construction activities	Direct impacts: » Loss of habitat and removal of vegetation	Medium-Low	» Clearing of the vegetation must be kept to a minimum » The final development footprint must be surveyed as part of a search and rescue programme (plants, small mammals and reptiles) before commencement of activity. These species should be translocated to available habitat in any of the adjacent to nature reserves that occur within similar vegetation types. » Any areas that remain after construction must be rehabilitated using local indigenous grass and tree species. » Construction activities must be restricted to the development area.
	» Loss of corridors and habitat fragmentation (The transformation of the study area could result in the loss of natural corridors, however as this site is isolated by the N2, farming activities and disturbed, the loss of any corridors would not occur. This is coupled to the fact that the surrounding landscape is largely disturbed and the size and scale of the operation is small.)	Medium-Low	» Clearing of the vegetation must be kept to a minimum » All areas that require rehabilitation after construction has been completed must be done using indigenous vegetation. » All hard surfaces must be kept to a minimum » Construction activities must be restricted to the development area.
	» Loss of rare and endangered species	Medium-Low	» Clearing of the vegetation must be kept to a

Activity	Impact summary	Significance (without - with mitigation)	Proposed mitigation
	(The transformation of the study area could result in the loss of rare or protected species)		minimum » The final development footprint must be surveyed as part of a search and rescue programme (plants, small mammals and reptiles) before commencement of activity. These species should be translocated to available habitat adjacent to the site. » Any areas that remain after construction and after decommissioning, must be rehabilitated using local indigenous grass and tree species
	» Increase in sedimentation and initiate accelerated erosion within the development footprint	Medium-Low	» Any stormwater within the site must be handled in a suitable manner, i.e. trap sediments and reduce flow velocities. » Clearing of the vegetation must be kept to a minimum » Any areas that remain after construction and after decommissioning must be rehabilitated using local indigenous grass and tree species. » All hard surfaces must be kept to a minimum
	Indirect impacts: » Sedimentation from erosion	Low	» All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may increase erosion risk.
	Cumulative impacts: » Due to the size and scale of the development, additional cumulative impacts are unlikely, when compared to the size / area cover of intact habitat that is located around the site.	Low	» Cumulative impacts of developments on population viability of species can be reduced significantly if new developments are kept as close as possible to existing developed areas or, where such is not possible, different sections of a development be kept

Activity	Impact summary	Significance (without - with mitigation)	Proposed mitigation
	» Possible spread and establishment of alien invasive species		as close together as possible. » 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.
<u>Visual Impacts</u>			
Construction of the PV array, power line, access roads and associated infrastructure.	<i>Direct impacts:</i> » Impact of construction activities on sensitive receptors such as homesteads and road users on the Provincial Main Road P234	Medium-Low	» Establish screening structures to shield construction works from sensitive receptors travelling on the main road and nearby homesteads » Good traffic and site management should be implemented » Local people should be kept informed regarding planned construction activities.
	<i>Indirect impacts:</i> » None		» None
	<i>Cumulative impacts:</i> » The construction of the PV plant, coupled with the power lines, ad substation and proposed biomass plant will contribute to an increased cumulative visual impact.	Medium-low	» None.
<u>Soil & Agricultural Impacts</u>			
Construction activities that disturb the soil profile, for example for levelling, excavations, etc.	<i>Direct impacts:</i> » Loss of agricultural land (The site is considered to have medium sensitivity to development. It is land capability class III and the soils are suitable for cultivation. However	Medium	» No mitigation possible (the land will be rehabilitated after decommissioning and could be used for agriculture if viable at that time)

Activity	Impact summary	Significance (without - with mitigation)	Proposed mitigation
	the impracticality of utilising it as part of the irrigation land on the farm reduces its sensitivity)		
	» Soil Erosion	Low	<ul style="list-style-type: none"> » Implement an effective system of run-off control, where it is required, that collects and safely 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. » Disturbed areas should be minimised as far as possible. » Rehabilitation should be undertaken as soon as possible following the completion of construction in an area.
	» Loss of topsoil	Low	<ul style="list-style-type: none"> » Strip and stockpile topsoil from all areas where soil will be disturbed. » Stockpile topsoil and subsoils separately. » After cessation of disturbance, re-spread topsoil over the surface. » Implement appropriate erosion control measures on topsoil stockpiles to minimise loss of this resource. » 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.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> » Sedimentation from erosion 	Low	<ul style="list-style-type: none"> » 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

Activity	Impact summary	Significance (without - with mitigation)	Proposed mitigation
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> » The significance of agricultural impacts is influenced by the fact that the site is land capability class III and the soils are suitable for cultivation. However the impracticality of utilising it as part of the irrigation land on the farm reduces the significance. The extent of the development is also small, so a minimal amount of land is impacted. 	Low	<p>an erosion risk.</p> <ul style="list-style-type: none"> » No mitigation possible.
<u>Social impacts</u>			
<p>Construction phase (Including all related infrastructure such as power lines, access roads, office and warehouse components)</p>	<p>Direct impacts:</p> <p>Potential Positive social impacts:</p> <ul style="list-style-type: none"> » Direct employment and skills development » Economic multiplier effects <p>Potential negative impacts:</p> <ul style="list-style-type: none"> » Safety and security risks » Pressure on economic and social infrastructure impacts from an in migration of people » Nuisance impacts (noise, dust and disruption or damage to adjacent properties) 	Low (-) Medium (+)	<ul style="list-style-type: none"> » The developer should implement a training and skills development enhancement programme for local community members during the construction 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. » Maximise the use of local labour for low – semi skilled jobs far as possible.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> » Local employed people during the construction phase may learn new skills 	Low (+)	<ul style="list-style-type: none"> » The developer should implement a training and skills development enhancement programme for locals during the construction phase. The aim of the

Activity	Impact summary	Significance (without - with mitigation)	Proposed mitigation
	<p>thereby making them more employable in the future.</p> <p>Cumulative impacts:</p> <ul style="list-style-type: none"> » Impacts on family and community relations » 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>programme should be to maximise the number of South African's and locals employed during the construction phase of the project.</p> <ul style="list-style-type: none"> » Attention should be given to the extension and improvement of the existing HIV/Aids awareness programmes in the area.
<u>Heritage impacts</u>			
<p>Construction of the PV array, power line, access roads and associated infrastructure.</p>	<p>Direct impacts:</p> <ul style="list-style-type: none"> » Impacts on heritage resources (i.e. archaeological sites, built structures over 60 years old, sites of cultural significance associated with burial grounds and graves, graves of victims of conflict, and significant cultural landscapes or viewsapes) <p>Indirect impacts:</p> <ul style="list-style-type: none"> » None <p>Cumulative impacts:</p> <ul style="list-style-type: none"> » The loss of a number of archaeological sites. 	<p>Low</p>	<ul style="list-style-type: none"> » 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 and/or SAHRA and AMAFA must be contacted for an assessment of the find. » None » If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the activities must be stopped and a qualified archaeologist must be contacted for

Activity	Impact summary	Significance (without - with mitigation)	Proposed mitigation
			an assessment of the find.
<i>Palaeontology impacts</i>			
Construction of the PV array, power line, access roads and associated infrastructure.	<i>Direct impacts:</i> Damage or destruction of fossil materials during the construction of project Infrastructural elements to a maximum depth of those excavations.	None	» Due to the unfossiliferous nature of the rocks underlying the Senekal 2 Solar Energy Facility it is not anticipated that any fossil materials will be negatively impacted upon. Accordingly, no damage mitigation procedures are required to be outlined for the project. » It is accordingly recommended that, should permission be granted for the project to proceed to commencement, a close examination of all excavations be made by a palaeontologist while they are occurring. Should any fossil materials be identified, the excavations should be halted and SAHRA informed of the discovery.
	<i>Indirect impacts:</i> None		» None
	<i>Cumulative impacts:</i> » The loss of access for scientific study to any fossil materials present beneath infrastructural elements for the life span of the existence of the facilities	Low	» It is accordingly recommended that, should permission be granted for the project to proceed to commencement, a close examination of all excavations be made by a palaeontologist while they are occurring. Should any fossil materials be identified, the excavations should be halted and SAHRA informed of the discovery.
Alternative 2			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		

Activity	Impact summary	Significance (without - with mitigation)	Proposed mitigation
	<i>Cumulative impacts:</i>		
Alternative 3			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		

Activity	Impact summary	Significance	Proposed mitigation
OPERATION			
Alternative 1 (preferred alternative): PV facility and associated infrastructure			
<u>Ecological impacts</u>			
Operation of PV array, access roads and associated infrastructure.	Direct impacts: » Negative faunal impacts due to operation » Increased erosion risk as a result of the presence of the facility	Low	» Any dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location by a suitably qualified person. » 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.
	Indirect impacts: » Sedimentation from erosion	Low	» 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.
	Cumulative impacts: » Due to the size and scale of the development, additional cumulative impacts are unlikely, when compared to the size / area cover of	Low	» 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.

Activity	Impact summary	Significance	Proposed mitigation
	<p>intact habitat that is located around the site. However, downstream erosion and sedimentation of the downstream systems could occur, although there is not direct connection with any of these systems.</p> <p>» Possible spread and establishment of alien invasive species</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>
<u>Visual impacts</u>			
Maintenance and operation of proposed PV plant	<p>Direct impacts:</p> <p>» Impact on the sense of place for people living and working locally due to change of local site character from agriculture to industrial</p>	Medium- Low	<p>» Screening between the site, the N2 and adjacent properties should be implemented.</p>
	<p>Indirect impacts:</p> <p>» None</p>		<p>» None</p>
	<p>Cumulative impacts:</p> <p>The area has a natural and agricultural character; however the area is proposed adjacent to the Mkuze Substation and an authorised biomass plant. In addition, power lines and the N2 national road traverse the areas which are infrastructural elements that have an impact on the visual resources in the area. The potential impact of the proposed Senekal 2 Solar Energy Facility on the area's sense of place is likely to be low to medium.</p>	Medium- Low	<p>» None</p>
<u>Soil and agricultural impacts</u>			
Occupation of the site by the footprint of the facility	<p>Direct impacts:</p> <p>» Loss of agricultural land</p>	Medium	<p>» No mitigation possible (land will be rehabilitated after decommissioning and could be available for agriculture)</p>
	<p>» Soil Erosion</p>	Low	<p>» Implement an effective system of run-off control,</p>

Activity	Impact summary	Significance	Proposed mitigation
			where it is required, that collects and safely 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. » Monitor and maintain rehabilitated areas in order to reduce erosion risk.
	Indirect impacts: » Sedimentation impacts on the adjacent canal and artificial wetland system	Medium-Low	Implement an effective system of run-off control, where it is required, that collects and safely 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.
	Cumulative impacts: The overall loss of agricultural land in the region due to other developments. The significance is medium due to the small extent of the development.	Medium	» No mitigation possible
Social impacts			
Including all related infrastructure such as power line, access roads, office and warehouse components	Direct impacts: Positive social impacts: » Direct employment and skills development » Development of clean, renewable energy infrastructure Potential negative impacts: » Visual and sense of place impacts » Impacts associated with the loss of potential agricultural land	Medium-Low (-) Low-Medium (+)	» Where possible, the developer should employ local community members. » Vegetation screening between the site, the N2 and adjacent properties should be implemented and where necessary additional vegetation screening should be established.

Activity	Impact summary	Significance	Proposed mitigation
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> » Locals employed during this phase may learn new skills thereby making them more employable in the future 	Low	<ul style="list-style-type: none"> » Where possible, the applicant should employ locals to form part of the operation phase team. » Develop a programme to maximise the number of South African's and locals employed during the operational phase of the project.
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> » The cumulative impact on the social environment of other developments in the area would increase the positive and negative social impacts. 	Medium-Low (-) Low-Medium (+)	The developer should be aware of the other projects in the area and work closely with the local municipality to development the community trust.
Alternative 2			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		
Alternative 3			
	<i>Direct impacts:</i>		
	<i>Indirect impacts:</i>		
	<i>Cumulative impacts:</i>		

Activity	Impact summary	Significance	Proposed mitigation
DECOMMISSIONING AND CLOSURE			
Alternative 1 (preferred alternative): PV facility and associated infrastructure			
Decommissioning of Solar Energy Facility	<p>Direct impacts:</p> <p>Social: Once the construction phase is complete, locals may not be able to find future employment</p>	Medium -Low	» Workers should acquire enough skills to equip them to get employment elsewhere in similar projects.
	<p>Visual:</p> <ul style="list-style-type: none"> » The major visual impact associated with the 	Medium -Low	» This would be short-term and would reduce through rehabilitation of the site.

Activity	Impact summary	Significance	Proposed mitigation
	decommissioning of the facility is the residual visual effects such as scarring of the landscape.		
	Soil: » Soil Erosion » Loss of topsoil	Low	» Implement an effective system of run-off control, where it is required, that collects and safely 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.
	Dust production and dust pollution	Low	» Apply appropriate dust control measures, i.e. water spraying.
	Increased alien plant invasion risk	Low	» 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 » Regular monitoring for alien plants within the development footprint for 2-3 years after decommissioning. » 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. » A cover of indigenous grass should be established to stabilise the soil.
	<i>Indirect impacts:</i>		
	Cumulative Impacts: Soil » Siltation of watercourses downstream	Low	» Implement appropriate soil erosion control measures at the source
NO-GO OPTION			

Activity	Impact summary	Significance	Proposed mitigation	
Construction, operation and decommissioning phase of the solar energy facility	<p>Direct impacts:</p> <ul style="list-style-type: none"> » Ecological impacts: the no-go option would result in in no ecological impact » Agricultural impacts: The 'do nothing' alternative will result in no impact on the current grazing use. » Social impacts: The no-go option would result in job opportunities not being realised resulting in further unemployment in the area. » Visual impacts: The visual character of the area would remain unchanged with the implementation of the do nothing option. » Heritage impacts: 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. 	Low	<ul style="list-style-type: none"> » The implementation of the project is the mitigation to the negative impacts 	
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> » 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. 		Low	<ul style="list-style-type: none"> » Implementation of the proposed project
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> » Contributing to further unemployment and unsustainable ways to produce electricity. 		Low	<ul style="list-style-type: none"> » 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.

Alternative A (preferred alternative)

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 specialist studies undertaken within this Basic Assessment:

- » In terms of the **ecology**, based on the available information and the site investigations, it shows that the proposed project would have **low impact** on any sensitive and / or important terrestrial. This is based on the assumption that no species of special concern are found on site, and would need to be confirmed during the growing season. With regard the **aquatic environment**, no such systems were observed within the site itself habitats. The most sensitive habitats would be the surrounding water courses and although **not directly on site** these should be avoided with regard new impacts (i.e. road crossings) that could directly surface flows off the site.
- » The significance of **agricultural impacts** is influenced by the fact that the site is land capability class III and the soils are suitable for cultivation. However the impracticality of utilising it as part of the irrigation land on the farm reduces the significance of the impact associated with the proposed project. The extent of the development is also small, so a minimal amount of land is impacted. The site is currently not used for agriculture. The development of the solar energy facility will have **low to medium** negative impacts on agricultural resources and productivity.
- » No **heritage** sites were recorded in the study area and due to the lack of shelters, knapping material or features in the landscape, like pans or rocky outcrops, no Stone Age Sites occur. It is concluded that the impacts of the proposed development on heritage resources such as archaeological sites, built structures over 60 years old, sites of cultural significance associated with burial grounds and graves, graves of victims of conflict, and significant cultural landscapes or viewsapes are considered to be **low**.

The project area is completely underlain by rocks of the Jurassic Letaba Formation. The extrusive, magmatic origins of the rocks that comprise the Letaba Formation preclude the possibility of any fossil materials being present within the unit. Thus, the **paleontological potential** of the Letaba Formation is assessed as being **nil**.

- » The area has a natural and agricultural character; however the area is proposed adjacent to the Mkuze Substation, there are power lines, the N2 national road traversing the areas which are infrastructural elements that have an impact on the **visual resources** in the area. The potential impact of the proposed Senekal 2 Solar Energy Facility on the areas sense of place is likely to be **low to medium**.
- » 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 proposed Senekal 2 Solar Energy Facility is unlikely to result in permanent damaging social impacts. From a social perspective it is concluded that the project could be developed subject to the implementation of the recommended mitigation measures and management actions contained in the report.
- » The **cumulative impacts** on ecology, heritage, and social will be **low** considering the limited size of the proposed infrastructure.

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 **Senekal 2 Solar Energy Facility** and associated infrastructure.

The significance levels of the majority of identified negative impacts are low to medium and can generally be further reduced 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.

On the basis of the findings of this Basic Assessment process, 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 Building Energy SpA 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 will be maintained.

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:

- » **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 17GW 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 and the benefits associated with the establishment of a Community Trust. This also represents a negative social cost. On a local level, should the development proceed, the landowner and local community will benefit from the proposed development financially. 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 Senekal 2 5MW PV Facility.

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:

Mitigation - 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.
- » Appoint an Environmental Control Officer (ECO) to monitor activities on site throughout the construction phase of the project
- » The development footprint should be kept to a minimum, and not exceed 10 ha.
- » Ecology study result in based on the assumption that no species of special concern are found on site, and would need to be confirmed during the growing season.
- » Temporary laydown areas should be located within identified previously transformed areas or disturbed areas. These areas should be rehabilitated after use.

- » Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust pollution becomes apparent).
- » Rehabilitate all adjacent or peripheral disturbed areas, laydown areas, access roads, etc. immediately after the completion of construction works in terms of the re-vegetation and habitat rehabilitation plan included in the EMPr. 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 and when required.
- » All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act (Act No. 43 of 1983), the implementation of a monitoring programme in this regard is recommended.
- » Training, skills development opportunities should be provided to the local community.
- » Local labour should be used as far as possible.

Mitigation - 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 opportunities should be provided to the local community.
- » Local labour should be used as far as possible.

Is an EMPr attached?

YES ✓

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

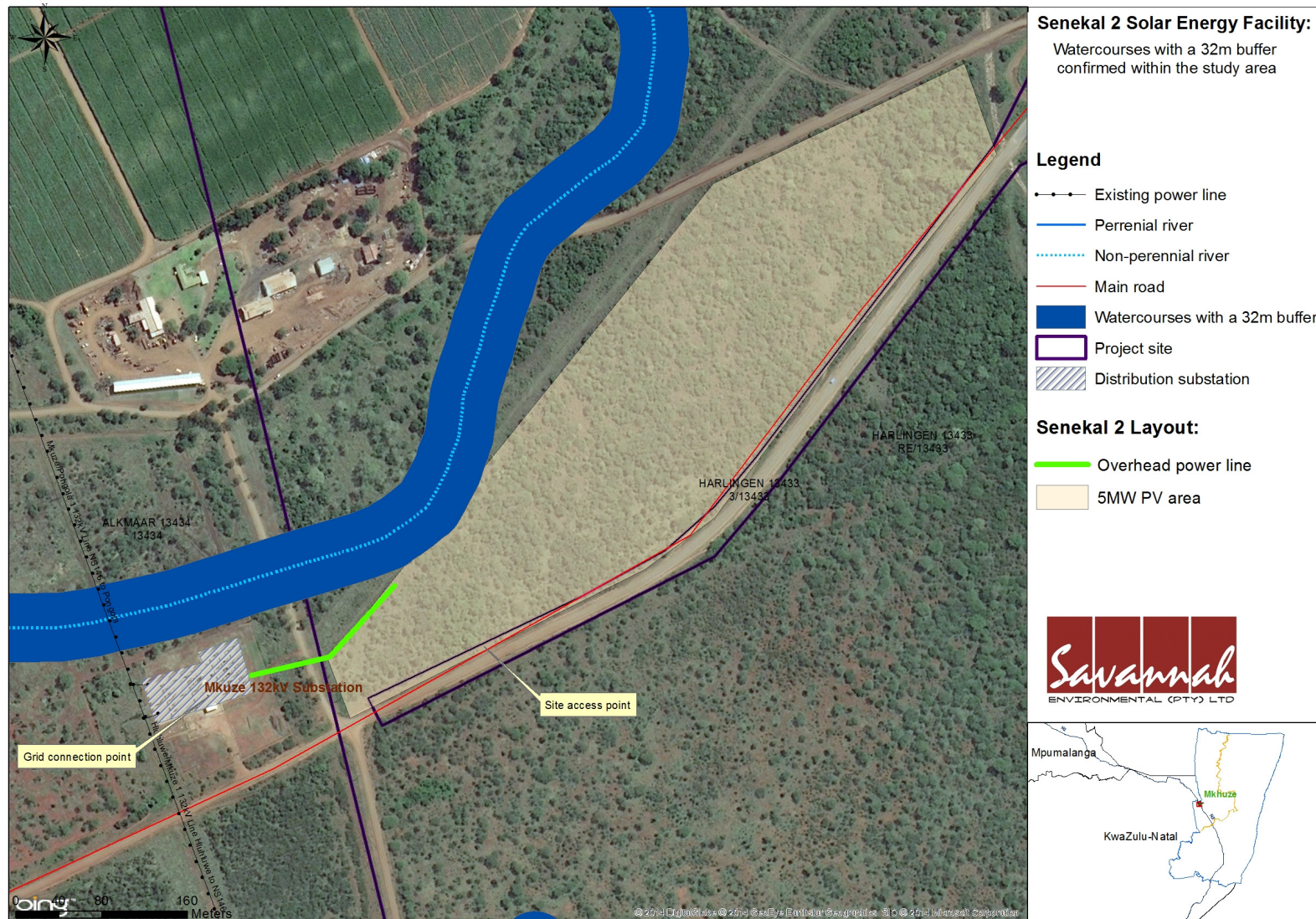


Figure 8: Map showing watercourses with a 32m buffer confirmed within the study area of the proposed Senekal 2 Solar Energy Facility

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**.

Karen Jodas

NAME OF EAP

08 September 2014

SIGNATURE OF EAP

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

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise & CVs

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information