

ENVIRONMENTAL IMPACT ASSESSMENT AND PUBLIC PARTICIPATION PROCESS

THE DEVELOPMENT OF MIDDELVLEI SOLAR TWO PHOTOVOLTAIC (PV) FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR RANDFONTEIN, GAUTENG PROVINCE

BACKGROUND INFORMATION DOCUMENT

April 2024

Middelvlei Two Solar (Pty) Ltd is proposing the construction and operation of a solar photovoltaic (PV) facility and associated infrastructure on the Remaining Extent of Portion 2 of the Farm Middelvlei 255-IQ within the Rand West City Local Municipality in the West Rand District Municipality in the Gauteng Province. The project site is located approximately 7km southwest of the town of Randfontein (refer to attached map). The facility will have a contracted capacity of up to 45MW and will be known as the Middelvlei Solar Two PV Facility.

The nature and extent of the project is explored in more detail in this Background Information Document (BID). In terms of Sections 24 and 24D of the National Environmental Management Act (No 107 of 1998), as read with Government Notice R324 – R327, as amended, Environmental Authorisation (EA) is required for the above-mentioned project. A Scoping and EIA (S&EIA) process is required to be completed in support of the Application for EA.

AIM OF THIS BACKGROUND INFORMATION DOCUMENT

This document aims to provide you, as an Interested and/or Affected Party (I&AP), with:

- » An overview of the proposed Middelvlei Solar Two PV Solar Energy Facility and associated infrastructure.
- » An overview of the S&EIA process and specialist studies being undertaken to assess the project.
- » Details of how you can become involved in the S&EIA process, receive information, or raise comments that may concern and/or interest you.

OVERVIEW OF THE PROJECT

The PV facility will have a contracted capacity of up to 45MW and will comprise the following infrastructure:

- » A solar PV plant comprising PV panels using single axis tracking technology.
- » Inverters and transformers.
- » Cabling between the panels.
- » Onsite 132kV facility substation, including conductors and metering site, with a footprint of~ 2.5ha.
- » Cabling from the onsite substation to the collector substation (either underground or overhead).

- » Electrical and auxiliary equipment required at the collector substation that serves the solar energy facility, including switchyard/bay, control building, fences, etc.
- » Battery Energy Storage System (BESS).
- » Site and internal access roads (up to 8m wide).
- » Temporary and permanent laydown areas.
- » Operations Building of ~200 sqm.

The development of the PV Solar Energy Facility aims to maximise electricity production through exposure to solar radiation, generating clean renewable energy which will directly assist in bringing additional megawatts into the country's electricity system through private sector investment. It will also assist in the reduction of carbon emissions through the generation of clean renewable energy while simultaneously generating employment opportunities through the construction and operation of the facility.

The Middelvlei Solar Two solar energy facility is proposed in response to the identified objectives of the national and provincial government and local and district municipalities to develop renewable energy facilities for power generation purposes. From a regional perspective, the area within the Gauteng Province identified for the project is considered favourable for the development of a commercial PV facility due to the feasible solar resource, grid connection, and availability of land on which the development can take place.

The project site, the Remaining Extent of Portion 2 of the Farm Middelvlei 255-IQ, with an extent of approximately 77ha, was identified by Middelvlei Two Solar (Pty) Ltd and is considered to be technically suitable for the development of the project.

OVERVIEW OF SOLAR PV TECHNOLOGY

Solar energy facilities use 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, therefore placing the electrons into a higher state of energy to create electricity. The solar fields of the PV facility will comprise the following components:

Photovoltaic Cells, Modules and Panels:

A PV cell is made of silicone that acts as a semiconductor used to produce the photovoltaic effect. PV cells are arranged in multiples / arrays and placed behind a protective glass sheet to form a PV module (Solar Panel). Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e., Direct Current (DC)). A solar PV module is made up of individual solar PV cells connected together, whereas a solar PV array is a system made up of a group of individual solar PV modules electrically wired together to form a much larger PV installation.

PV panels are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance.

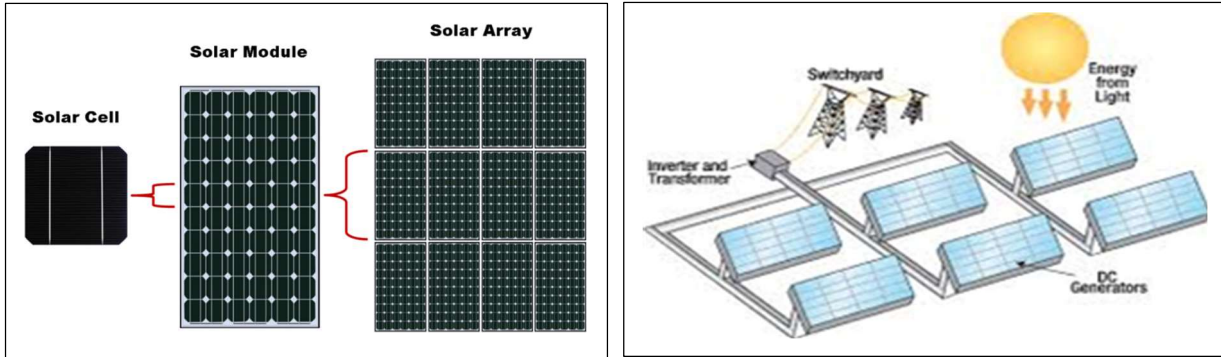


Figure 1: Overview of a PV cell, module, and array / panel (Source: pveducation.com).

Inverters

Inverters are used to convert the electricity produced by the PV cells from DC into Alternating Current (AC) to enable the facility to be connected to the national electricity grid to deliver the power to off takers. Numerous inverters will be arranged in several arrays to collect and convert power produced by the facility.

Support Structures

The PV panels will be fixed to support structures to maximise exposure to the sun. They can either utilise fixed / static support structures or alternatively single or double axis tracking support structures. PV panels that utilise fixed / static support structures are set at an angle (fixed-tilt PV system), to optimise the amount of solar irradiation. With fixed / static support structures, the angle of the PV panel is dependent on the latitude of the proposed development and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels that utilise tracking support structures track the movement of the sun throughout the day, to receive the maximum amount of solar irradiation.

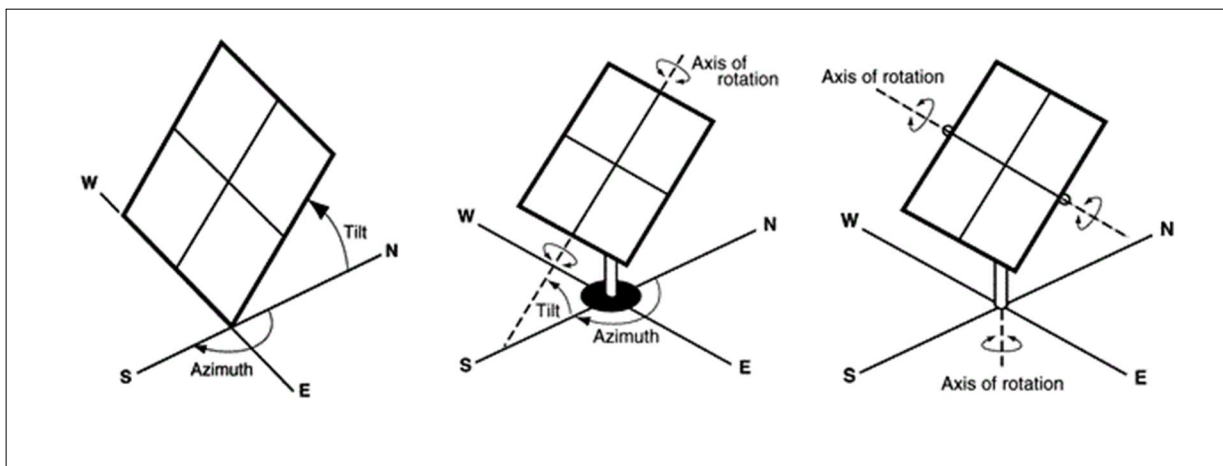


Figure 2: Overview of different PV tracking systems (from left to right: fixed-tilt, single-axis tracking, and double-axis tracking (Source: pveducation.com)).

Bifacial and Monofacial Solar Panel Technology

Bifacial (“two-faced”) modules produce solar power from both sides of the panel. Bifacial solar panels have solar cells on both sides, which enables the panels to absorb light from the back and the front (refer to **Figure 3**). Practically speaking, this means that a bifacial solar panel can absorb light reflected off the ground or

another material. In general, more power can be generated from bifacial modules for the same area, without having to increase the development footprint.

The optimum tilt for a bifacial module has to be designed so as to capture a big fraction of the reflected irradiation. The use of trackers is recommended so the modules can track the sun's movement across the sky, enabling them to stay directed to receive the maximum possible sunlight to generate power.

Monofacial solar panels capture sunlight on one light-absorbing side. The light energy that cannot be captured is simply reflected away (refer to **Figure 3**).

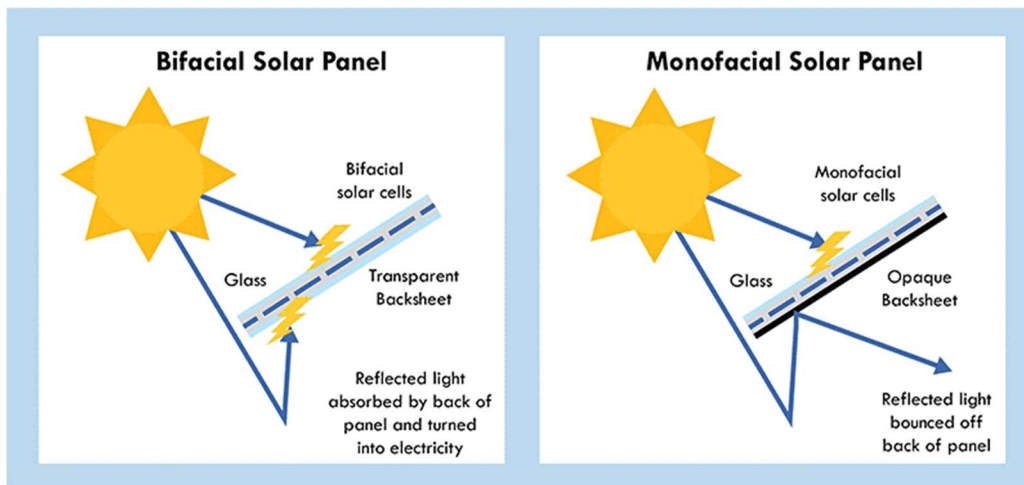


Figure 3: Diagram showing how bifacial and monofacial Solar PV panels work (Source: <https://www.solarkobo.com/post/bifacial-solar-panels>).

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

In accordance with the EIA Regulations, 2014 (as amended) published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA), the applicant requires Environmental Authorisation (EA) from the Gauteng Department of Agriculture and Rural Development (GDARD) for the development of the proposed project. In terms of Section 24(5) of NEMA, the EIA Regulations 2014 (as amended) and Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325) and Listing Notice 3 (GNR 324), the application for the EA for the Middelvlei Solar PV Energy Facility is subject to the completion of a S&EIA process. The application for EA is required to be supported by comprehensive, independent environmental studies undertaken in accordance with Appendix 6 of the EIA Regulations, 2014, as amended, and where relevant, in line with the gazetted protocols.

An EIA is an effective planning and decision-making tool. It allows for potential environmental consequences resulting from a proposed activity to be identified and appropriately managed during the construction, operation, and decommissioning phases of development. It also provides an opportunity for the project applicant to be forewarned of potential environmental issues and allows for the resolution of issue(s) identified and reported on as part of the EIA process, as well as provides opportunity for dialogue with key stakeholders and Interested and Affected Parties (I&APs).

Savannah Environmental has been appointed as the independent environmental consultant responsible for managing the application for EA and undertaking the supporting S&EIA process required to identify and assess potential environmental impacts associated with the project, as well as propose appropriate mitigation and management measures to be contained within the Environmental Management Programme (EMPr) for the facility.

WHAT ARE THE POTENTIAL ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED PROJECTS?

The project will be assessed by independent environmental specialists to identify the potential for environmental impacts. Specialist studies that are proposed as part of the EIA process include the following:

Specialist study	Scope
Biodiversity Impact Assessment	Assessment of impacts on ecology, fauna and flora associated with disturbance of vegetation, fauna, habitats and ecological processes within the project area.
Wetland and freshwater Impact Assessment	Assessment of impacts on freshwater resources associated with disturbance to drainage lines, rivers, and wetlands at a broad and fine scale.
Avifauna Impact Assessment	Pre-construction monitoring in terms of the relevant guidelines to inform the assessment of the impact on avifaunal habitats and sensitive species.
Soils and Agricultural Potential Assessment	Determination of land types within the project area, and assessment of the significance of loss of agricultural land due to the project development and impacts relating to soil degradation and/or erosion.
Heritage Impact Assessment (Archaeology and Palaeontology)	Assessment of impacts on heritage resources due to disturbance or destruction of heritage sites and fossils during the construction phase through excavation activities, and assessment of impacts on heritage resources during operation as a result of visual impact.
Visual Impact Assessment	Determination of the presence of visual sensitive receptors in the area and assessment of the impact of the project on these receptors and the overall aesthetics within the area.
Social Impact Assessment	Assessment of the positive and negative impacts on the social environment as a result of the construction and operation of the project.

Site-specific studies will be undertaken to assess the potential impact of the proposed development, delineate areas of sensitivity within the development area, assess impacts associated with the project and make recommendations regarding avoidance, management and mitigation of impacts. Studies will be informed by available information and detailed field investigations undertaken in accordance with the relevant guidelines and protocols. Once the constraining environmental factors have been determined, the layout for the proposed facility can be determined and presented in the EIA reporting.

PUBLIC PARTICIPATION PROCESS

The sharing of information forms the basis of the public participation process and offers I&APs the opportunity to become actively involved in the EIA process. Comments and inputs from I&APs are encouraged in order to ensure that potential impacts are considered throughout the EIA process. The public participation process aims to ensure that:

- » Information containing all relevant facts in respect of the application is made available to I&APs for review.
- » I&AP participation is facilitated in such a manner that they are provided with reasonable opportunity to comment on the proposed project.
- » An adequate review period is provided for I&APs to comment on the findings of the Scoping and EIA Reports.

In order to ensure effective participation, the public participation process includes the following:

- » Identifying I&APs, including affected and adjacent landowners and occupiers of land, and relevant Organs of State, and recording details within a database.
- » Providing an opportunity for registered I&APs and stakeholders to engage with the project team.
- » Placing site notices at the affected properties and in the study area.
- » Placing an advertisement in a local newspaper to provide details of the EIA process and the availability of reports for public review and comment.
- » Notifying registered I&APs of the release of the reports for review and comment, meetings to be held, and the closing dates by which comments must be received.
- » Providing an opportunity to engage with the project team via appropriate mechanisms, including meetings, telephonic consultations and written correspondence.
- » Notifying I&APs of GDARD'S decision on whether to grant or refuse the EA, and the manner in which such decision may be appealed.

YOUR RESPONSIBILITIES AS AN I&AP

In terms of the EIA Regulations, 2014 (as amended) and the Public Participation Guidelines, 2014, your attention is drawn to your responsibilities as an I&AP:

- » To participate in the EIA process, you must register yourself on the I&AP database.
- » You are required to disclose any direct business, financial, personal, or other interest that you may have in the approval or refusal of the application.
- » You must ensure that any comments regarding the proposed project are submitted within the stipulated timeframes.

HOW TO BECOME INVOLVED

- » By responding by phone, fax, or e-mail to the invitation for your involvement.
- » By returning the reply form to relevant contact person.
- » By engaging with the project team during the EIA process.
- » By contacting the environmental consultant with queries or comments.
- » By reviewing and commenting on the Reports within the stipulated review and comment periods.

If you consider yourself an I&AP for the proposed project, we urge you to make use of the opportunities created by the public participation process to provide comment, raise issues and concerns which affect and / or interest you, or request further information. Your input forms a key element of the EIA process.

By completing and submitting the accompanying reply form, you automatically register yourself as an I&AP for the proposed project, and are ensured that your comments, concerns, or queries raised regarding the project will be noted. Any personal information obtained through this EIA process will be processed in accordance with the conditions of lawful processing as set out in terms of Protection of Personal Information (POPI) Act. All comments received will be included in the project documentation as required by the EIA Regulations. This may include personal information. Note that you have the right to request us to update, correct or delete your personal information. Should you request to be de-registered, you will no longer receive correspondence regarding this assessment process.

COMMENTS AND QUERIES

Direct all comments, queries, or responses to:

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To view project documentation, visit the online stakeholder engagement platform at www.savannahSA.com.

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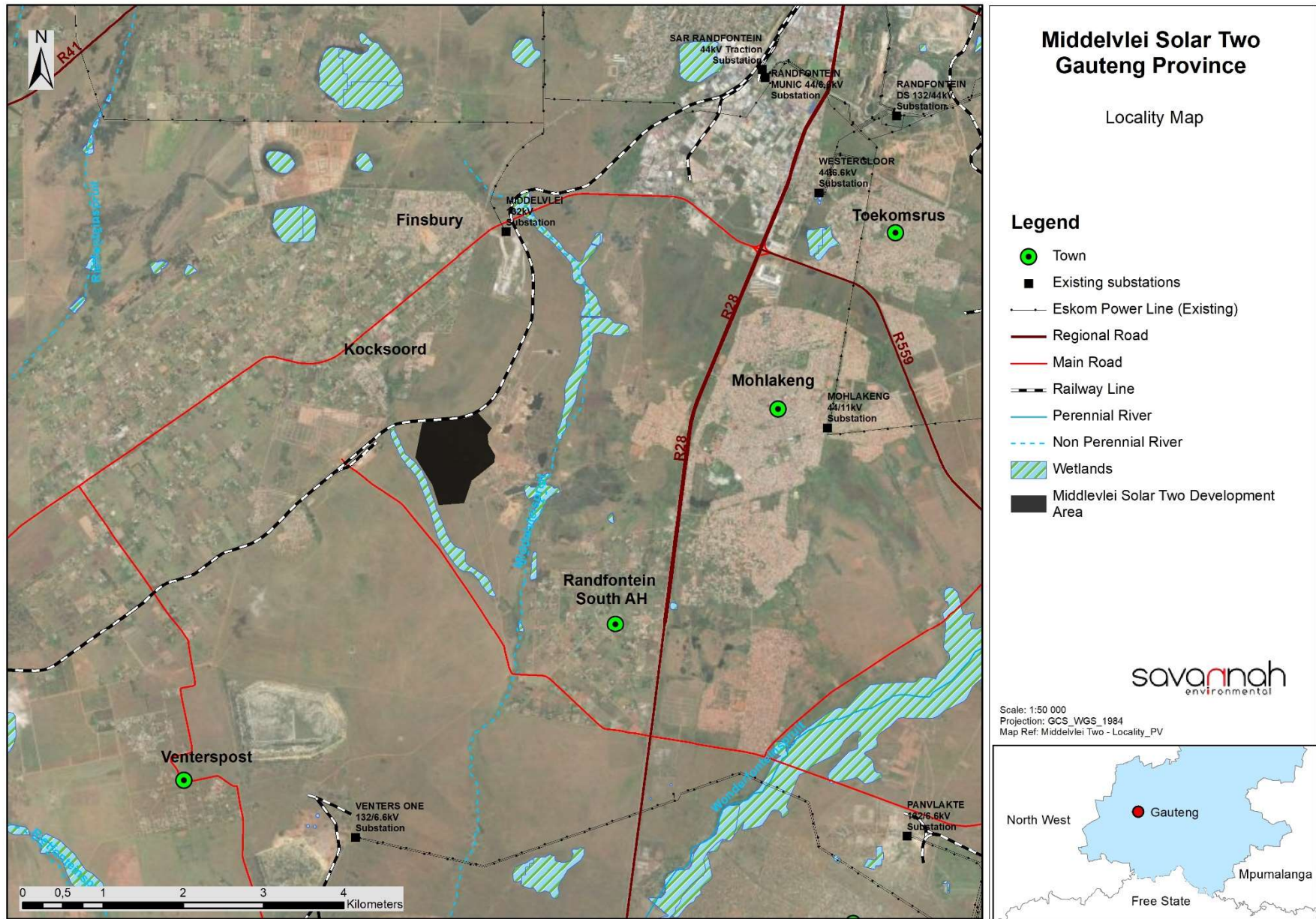


Figure 1: Locality map of the proposed Middelveli Solar 2 PV Solar Energy Facility.

