

# MARIKANA Solar PV Facility

Northern West Province

Final Scoping Report

August 2022

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## PROJECT DETAILS

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<b>Client</b>	:	MARIKANA Solar / Sibanye Stillwater PGM
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**When used as a reference this report should be cited as:** Savannah Environmental (2022) Scoping Report MARIKANA Solar PV Facility, North West Province

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## PURPOSE OF THE SCOPING REPORT AND INVITATION TO COMMENT

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MARIKANA Solar PV (Pty) Ltd has appointed Savannah Environmental as the independent environmental consultant to undertake the Scoping and Environmental Impact Assessment Process for the MARIKANA Solar PV Facility. The EIA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998). This Scoping report has been compiled in accordance with Appendix 2 of the EIA Regulations, 2014 (as amended) and consists of the following sections:

This Scoping Report represents the findings of the Scoping Phase of the EIA process and contains the following chapters:

- » **Chapter 1** provides background to the MARIKANA Solar PV Facility project and the environmental impact assessment.
- » **Chapter 2** provides a project description of the MARIKANA Solar PV Facility project.
- » **Chapter 3** provides the site selection information and identified project alternatives.
- » **Chapter 4** outlines strategic regulatory and legal context for energy planning in South Africa and specifically for the proposed facility.
- » **Chapter 5** describes the need and desirability of MARIKANA Solar PV Facility.
- » **Chapter 6** outlines the process which was followed during the scoping phase of the EIA process.
- » **Chapter 7** describes the existing biophysical and social environment within and surrounding the study and development area.
- » **Chapter 8** provides an identification and evaluation of the potential issues associated with the proposed solar PV facility and associated infrastructure.
- » **Chapter 9** presents the conclusions of the scoping evaluation for the MARIKANA Solar PV Facility.
- » **Chapter 10** describes the Plan of Study (PoS) for the EIA phase.
- » **Chapter 11** provides references used to compile the Scoping report.

The Scoping Report was made available for review from 11 July to 11 August. All comments received and recorded during the 30-day review and comment period was included, considered, and addressed where possible within the final Scoping report for the consideration of the North West Department of Economic Development Environment, Conservation and Tourism.

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## EXECUTIVE SUMMARY

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MARIKANA Solar (Pty) Ltd, as part of Sibanye Stillwater PGM operations, proposes the development of a renewable energy facility to supply electricity to the mine. The project entails the development of a Solar PV facilities, grid connection and other associated infrastructure with a contracted capacity of up to 30MW and will be known as MARIKANA Solar PV. The Solar PV facility is proposed on a site near current Sibanye Stillwater mining operations ~8km east from the town of Marikana, within the Rustenburg Local Municipality, and within the greater Bonjanala Platinum District Municipality, North West Province. The project will tie-in to the electricity grid behind the Eskom meter at the respective Sibanye customer substations. A study area consisting of Portion 9 of Farm Middelkraal No. 466. is being considered for the solar PV facility.

The PV facility is planned to be located within an area which belongs to the mine, it is however not on any area that will impact mining activities. Site-specific studies and assessments to be undertaken within the EIA process will delineate areas of potential sensitivity within the identified project site. Once constraining factors have been confirmed, the layout of the solar PV facility can be planned to minimise social and environmental impacts. A development area of approximately 220 ha has been identified within the study area for the construction and operation of the MARIKANA Solar PV Facility and its associated infrastructure, which is described and evaluated within this Scoping Report.

As of 2021, the Industrial sector was the leading electricity consumer in South Africa, with up to 51 percent of the total consumption (Ratshomo, 2021). Mining and quarrying accounted for 10% of the industrial consumption while non-ferrous metals and non-metallic both accounted for 8% and 5%, respectively (*Chamber of Mines of South Africa, 2017*,). The North West Province is rated as the fourth largest electricity consuming province in South Africa and consumes approximately 12% of the available electricity (Department of Economic Development, Environment, Conservation and Tourism 2012). This is mainly due to the high demand of the energy-intensive mining and related industrial sector. Approximately 63% of the electricity supplied to the North West Province is consumed in its mining sector (DEDECT 2012).

The North West Department of Economic Development, Environment, Conservation and Tourism's (DEDECT) renewable energy strategy aims to improve the North West Province's environment, reduce the North West Province's contribution to climate change, and alleviate energy poverty, whilst promoting economic development and job creation in the province whilst developing its green economy. Sibanye Stillwater aims to comply with the Mining industry's Mission to decarbonise.

The successful development of the renewable energy projects will enable Sibanye Stillwater to make a valuable and meaningful contribution towards growing the green economy within the province and South Africa. This will assist the North West Province in creating green jobs and reducing Green House Gas emissions, whilst reducing the energy demand on the National Grid.

The infrastructure associated with the solar PV facility, including all associated infrastructure will include:

- » Solar PV array comprising bifacial PV modules and mounting structures, using single axis tracking technology. Once installed will stand up to 5m above ground level.
- » Inverters and transformers.
- » Cabling between the project components.
- » Balance of Plant

- » On-site facility substation to facilitate the connection between the solar PV facility and Eskom electricity grid. The Size and Capacity of the on-site stations will be 30MW.
- » An onsite medium voltage (MV) switching station forming part of the collector substation
- » 100MWh Battery Energy Storage System (BESS) per site
- » Temporary Laydown areas.
- » Access roads, internal roads and fencing around the development area.
- » Up to 132kV Overhead Power Lines (OHPL) – maximum of 30m height with a 15m servitude width
- » Underground LV cabling will be used on the PV site

Most potential impacts identified to be associated with the construction of Marikana Solar PV facility and associated infrastructure are anticipated to be localized and restricted to the development area itself and the grid connection corridor alternative, while operation phase impacts/benefits range from local to regional. No environmental fatal flaws were identified to be associated with the development area. Areas or features of high sensitivity were identified to be avoided by the development footprint.

The potentially significant issues related to the construction of the Marikana Solar PV Facility include:

### **Sensitivity Analysis for the MARIKANA Solar PV Facility**

This section considers the sensitive features located within the development area, as identified by the independent specialists within each respective field, and also indicates the locations of the sensitive features within the development area.

The potentially sensitive areas which have been identified through the scoping study are listed below and illustrated in Figure 8.1. The detail is based on the desktop review of available baseline information for the project site, as well as the sensitivity data from specialist studies undertaken during the scoping phase, which included limited field surveys. During the site and desktop surveys, the affected area was investigated in sufficient detail in order to provide definitive insight into the potential for constraining factors on the site. The sensitivity map must be used as a tool by the developer to avoid any areas flagged to be of higher risk or sensitivity and inform the location/layout of the development footprint for the facility and associated infrastructure. The development footprint is the area which will be assessed further in detail in the EIA Phase, in order to provide an assessment of environmental acceptability and suitability of the facility layout of the MARIKANA Solar PV Facility.

### **Ecological Sensitive Features**

Based on the desktop assessment it can be said that the project area is somewhat sensitive with a moderate-high likelihood of species of conservation concern occurring. This assumption is based on the CBA1, ESA2, NPAES (priority focus area), Magaliesberg IBA and Magaliesberg Biosphere Reserve found in and around the project area.

The expectant anthropogenic activities are likely to drive habitat destruction causing displacement of fauna and flora and possibly event direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area.

### **Freshwater Sensitive Features**

A key consideration for the impact assessment is the presence of the identified water resources in relation to the project area. The available data also suggests the absence of features in the project area, with wetlands system expected for the 500 m regulation area.

Construction could result in the encroachment into water resources and result in the loss or degradation of these system, most of which are functional and provide ecological services. These disturbances could also result in the infestation and establishment of alien vegetation would affect the functioning of the systems. Leaks and/or spillages could result in contamination of the receiving water resources. Contaminated water resources are likely to have an effect on the associated biota. An increase in stormwater runoff could result in physical changes to the receiving systems caused by erosion, run-off and also sedimentation, and the functional changes could result in changes to the vegetative structure of the systems

### **Avifaunal Sensitive Features**

The SABAP2 Data lists 346 avifauna species that could be expected to occur within the area. Fourteen (14) of these expected species are regarded as threatened. Eleven of the species have a low likelihood of occurrence due to lack of suitable habitat and food sources in the project area. *Coracias garrulous* (European Roller), *Falco biarmicus* (Lanner Falcon), *Falco vespertinus* (Red-footed Falcon) has a moderate, high and moderate, respectively. The destruction of habitat along with the risk of electrocutions and collisions is regarded as the greatest risk for avifauna associated with solar plants and associated grid lines

### **Soils and Agricultural Potential Sensitive Features**

Various soil forms are expected throughout the project area, of which some are commonly associated with higher land capabilities. Even though the soil depth, texture and permeability of these soils ensure high land capability, the climatic capability of the area often reduces the land potential considerably. Areas characterised by "High" land potential are expected for selected areas.

The proposed development can result in the loss of land capability. The disturbances could further also result in the infestation and establishment of alien vegetation, which in turn can have a detrimental impact on soil resources. The development of the area could also result in compaction and/or erosion. Further to this, these activities could also cause leaks and/or spillages resulting in contamination of soil resources, which could affect the salinity or pH of the soil, which can render the fertility of the soil unable to provide nutrition to plants.

### **Heritage sensitive features, the cultural landscape (incl. archaeology, palaeontology, and cultural landscape)**

Heritage sensitivity relates to archaeological resources, heritage resources, and the cultural landscape. Databases kept and maintained at institutions such as the PHRA, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and SAHRA's national archive (referred to as the South African Heritage Resources Information System, (SAHRIS) were consulted to determine whether any heritage resources of significance had been identified during earlier heritage surveys in or near the project area. The larger project area has been subjected to several heritage assessments studies in the past. Literature relating to the pre-historical and the historical unfolding of the region where the project area is located was reviewed. The Phase I HIA study for the proposed MARIKANA Solar PV Facility Project revealed

none of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999). Paleo sensitivity is indicated as medium according to the DFFE online screening tool.

As a result of the absence of any heritage resources in the project area no significance rating for any heritage resources or for the possible impact of the MARIKANA PV Solar Facility Project on any heritage resources was undertaken. There is consequently no reason from a heritage point of view why the proposed MARIKANA Solar PV Facility Project could not proceed. However, chance-find procedures for both heritage resources and graves are recommended and are fully outlined in the report.

### **Visual sensitive features**

The fact that some components of the proposed MARIKANA PV facility and associated infrastructure may be visible does not necessarily imply a high visual impact. Sensitive visual receptors within (but not restricted to) a 3km buffer zone from the facility need to be identified and the severity of the visual impact assessed within the EIA phase of the project.

It is recommended that additional spatial analyses be undertaken to create a visual impact index that will further aid in determining potential areas of visual impact. This exercise should be undertaken for the core PV facility as well as for the ancillary infrastructure, as these structures (e.g., the BESS structures and power line) are envisaged to have varying levels of visual impact at a more localized scale. The site-specific issues (as mentioned earlier in the report) and potential sensitive visual receptors should be measured against this visual impact index and be addressed individually in terms of nature, extent, duration, probability, severity, and significance of visual impact. No no-go areas have been identified at this stage in the process.

This recommended work must be undertaken during the Environmental Impact Assessment (EIA) Phase of reporting for this proposed project.

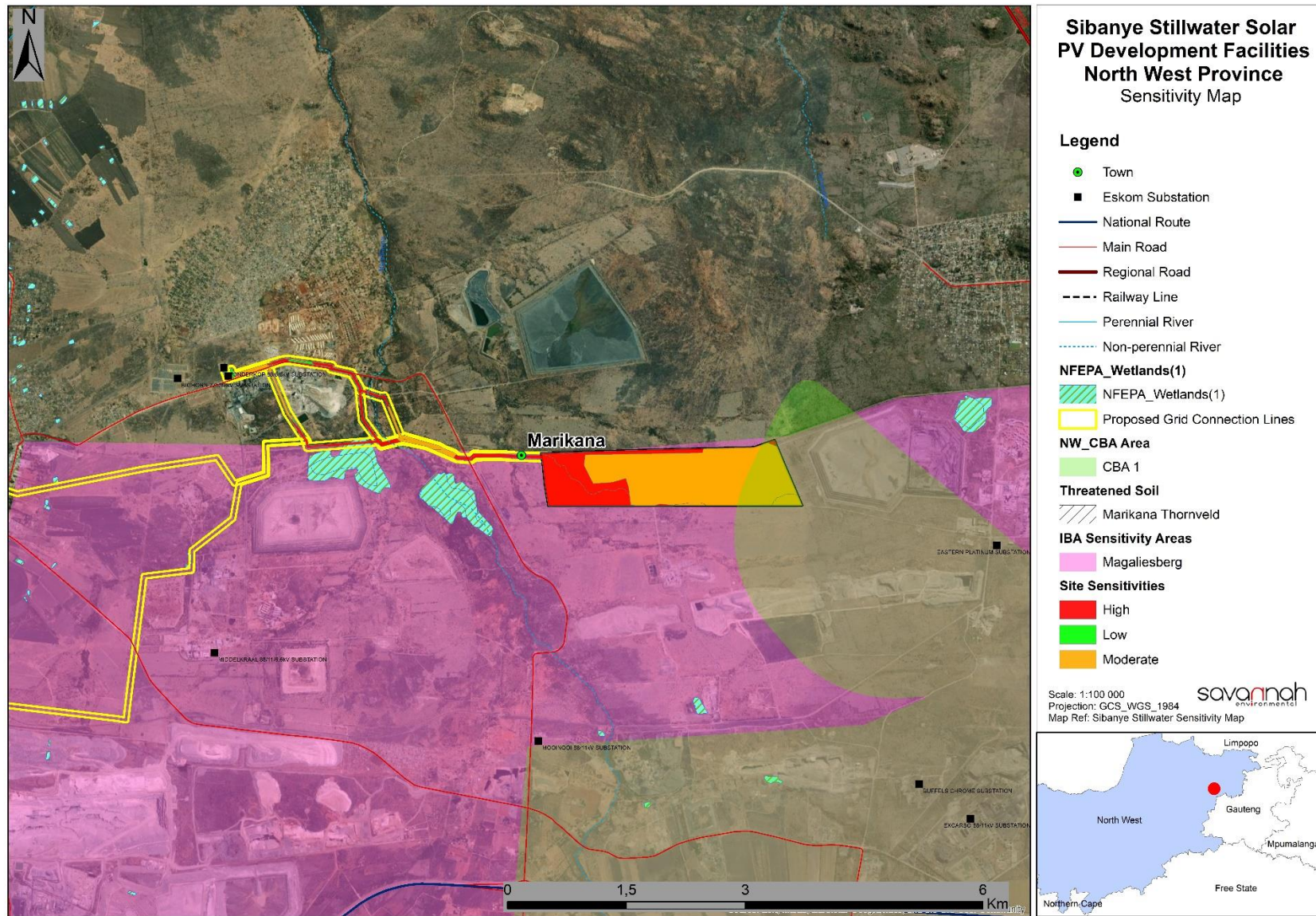
### **Overall Conclusion and Fatal Flaw Analysis**

The findings of the desktop Scoping Study indicate that no environmental fatal flaws are associated with the MARIKANA Solar PV Facility project site. While some impacts of potential significance do exist, it is anticipated that the implementation of appropriate mitigation measures would assist in reducing the significance of such impacts to acceptable levels. It is however recommended, that the development area for the development of the facility be considered outside of the potential sensitive areas as far as possible in order to ensure that the development does not have a detrimental impact on the environment. This forms part of the 'funnel-down approach' for the identification of an appropriate development footprint within the project site.

With an understanding of which areas within the project site are considered sensitive to the development of the proposed facility, the Applicant can prepare the detailed infrastructure layout for consideration within the EIA Phase. During the EIA phase, more detailed environmental studies will be conducted in line with the Plan of Study for EIA contained in Chapter 9 of this Scoping Report. These studies will consider the detailed layouts produced by the Applicant and make recommendations for the implementation of avoidance strategies (if required), and mitigation and management measures to ensure that the final assessed layout retains an environmental impact within acceptable limits. The sensitivity map will be further refined in the EIA phase on the basis of these specialist studies, in order to provide an assessment of environmental acceptability of the final design of the facility.



No environmental fatal flaws were identified to be associated with the development of the Marikana Solar PV Facility on the identified project site at this stage in the process. **Figure 1** provides an environmental sensitivity map of the scoping phase no-go areas. This conclusion must be confirmed through a detailed investigation of the development footprint within the EIA Phase of the process.



**Figure 1** Environmental Sensitivity Map from The Results of The Scoping Evaluation for The Marikana Solar PV Facility and Associated Infrastructure. The Sensitivity Map Indicates the Sensitivities for The Project Site, As Well As the Development Area.

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## CHAPTER 1 INTRODUCTION

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MARIKANA Solar (Pty) Ltd, as part of Sibanye Stillwater South African Platinum Group Metals (SA PGM) operations proposes the development of a renewable energy facility to supply electricity to the mine. The project entails the development of a Solar PV facilities, grid connection and other associated infrastructure with a contracted capacity of up to 30MW and will be known as MARIKANA Solar PV. The Solar PV facility is proposed on a site near current Sibanye Stillwater mining operations ~8km east from the town of Marikana, within the Rustenburg Local Municipality, and within the greater Bonjanala Platinum District Municipality, North West Province. The project will tie-in to the electricity grid behind the Eskom meter at the respective Sibanye customer substations. A study area consisting of Portion 9 of Farm Middelkraal No. 466. is being considered for the solar PV facility (**refer to Figure 1.1**).

The project is planned as part of Sibanye Stillwater's PGM North West renewable energy projects, which consists of three PV facilities with a combined contracted capacity of up to 205MW and will be known as SRPM Solar PV, Karee Solar PV, and Marikana Solar PV respectively, each including a grid connection and other associated infrastructure. These projects are proposed by separate Specialist Purpose Vehicles (SPVs) and are assessed through separate Environmental Impact Assessment (EIA) processes. The relative location of the three development areas and the grid connection infrastructure with alternatives are indicated in **Figure 1.2**. This scoping report refers to the Marikana application

The PV facility is planned to be located within an area which belongs to the mine, it is however not on any area that will impact mining activities. Site-specific studies and assessments to be undertaken within the EIA process will delineate areas of potential sensitivity within the identified project site. Once constraining factors have been confirmed, the layout of the solar PV facility can be planned to minimise social and environmental impacts. A development area of approximately 220 ha has been identified within the study area for the construction and operation of the MARIKANA Solar PV Facility and its associated infrastructure, which is described and evaluated within this Scoping Report.

As of 2021, the Industrial sector was the leading electricity consumer in South Africa, with up to 51 percent of the total consumption (Ratshomo, 2021). Mining and quarrying accounted for 10% of the industrial consumption while non-ferrous metals and non-metallic both accounted for 8% and 5%, respectively (*Chamber of Mines of South Africa, 2017*). The North West Province is rated as the fourth largest electricity consuming province in South Africa and consumes approximately 12% of the available electricity (Department of Economic Development, Environment, Conservation and Tourism 2012). This is mainly due to the high demand of the energy-intensive mining and related industrial sector. Approximately 63% of the electricity supplied to the North West Province is consumed in its mining sector (DEDECT 2012).

The North West Department of Economic Development, Environment, Conservation and Tourism's (DEDECT) renewable energy strategy aims to improve the North West Province's environment, reduce the North West Province's contribution to climate change, and alleviate energy poverty, whilst promoting economic development and job creation in the province whilst developing its green economy. Sibanye Stillwater aims to comply with the Mining industry's Mission to decarbonise.

The successful development of the renewable energy projects will enable Sibanye Stillwater to make a valuable and meaningful contribution towards growing the green economy within the province and South Africa. This will assist the North West Province in creating green jobs and reducing Green House Gas emissions, whilst reducing the energy demand on the National Grid.

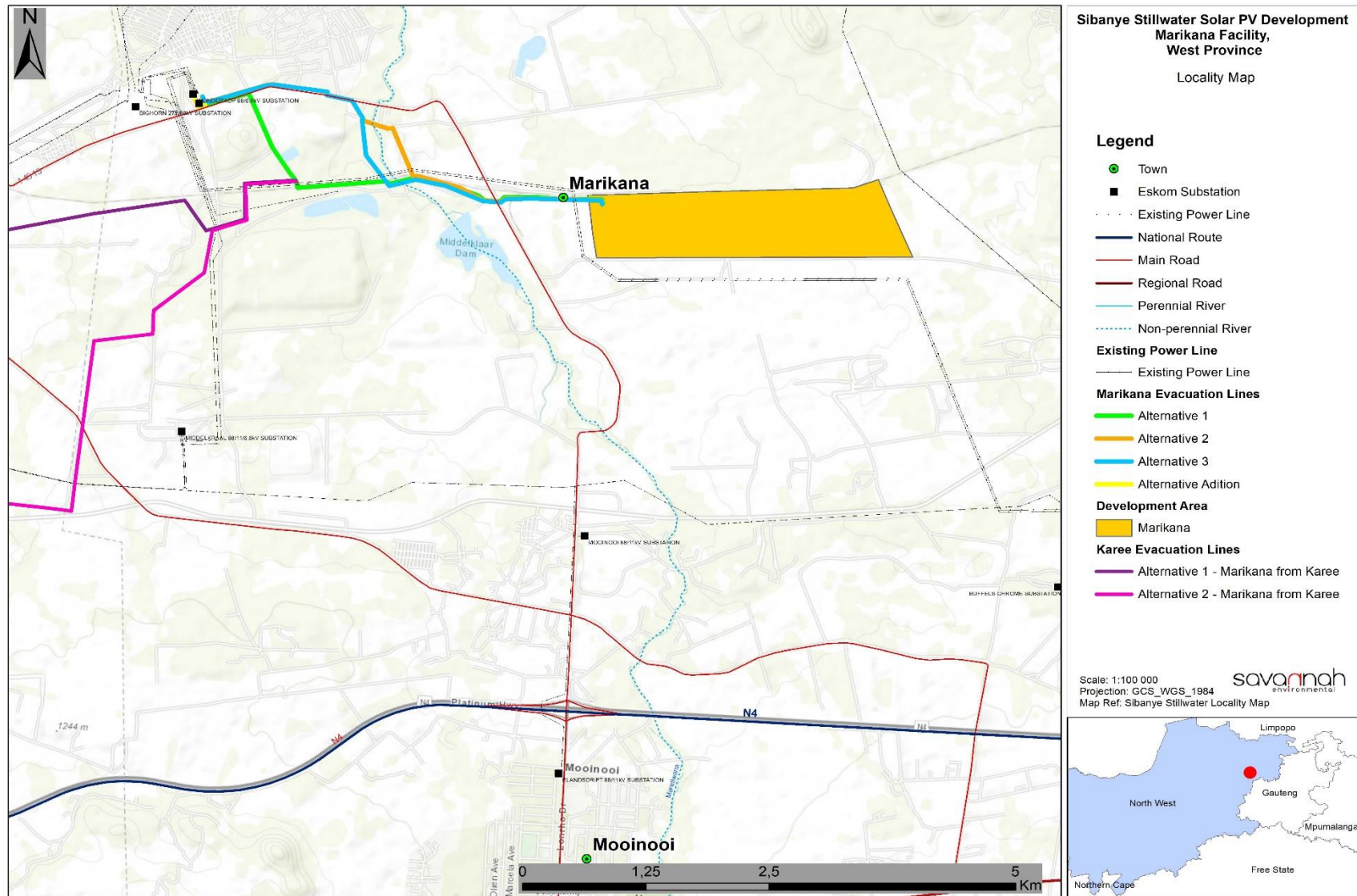


## **1.1. Requirement for an Environmental Impact Assessment Process**

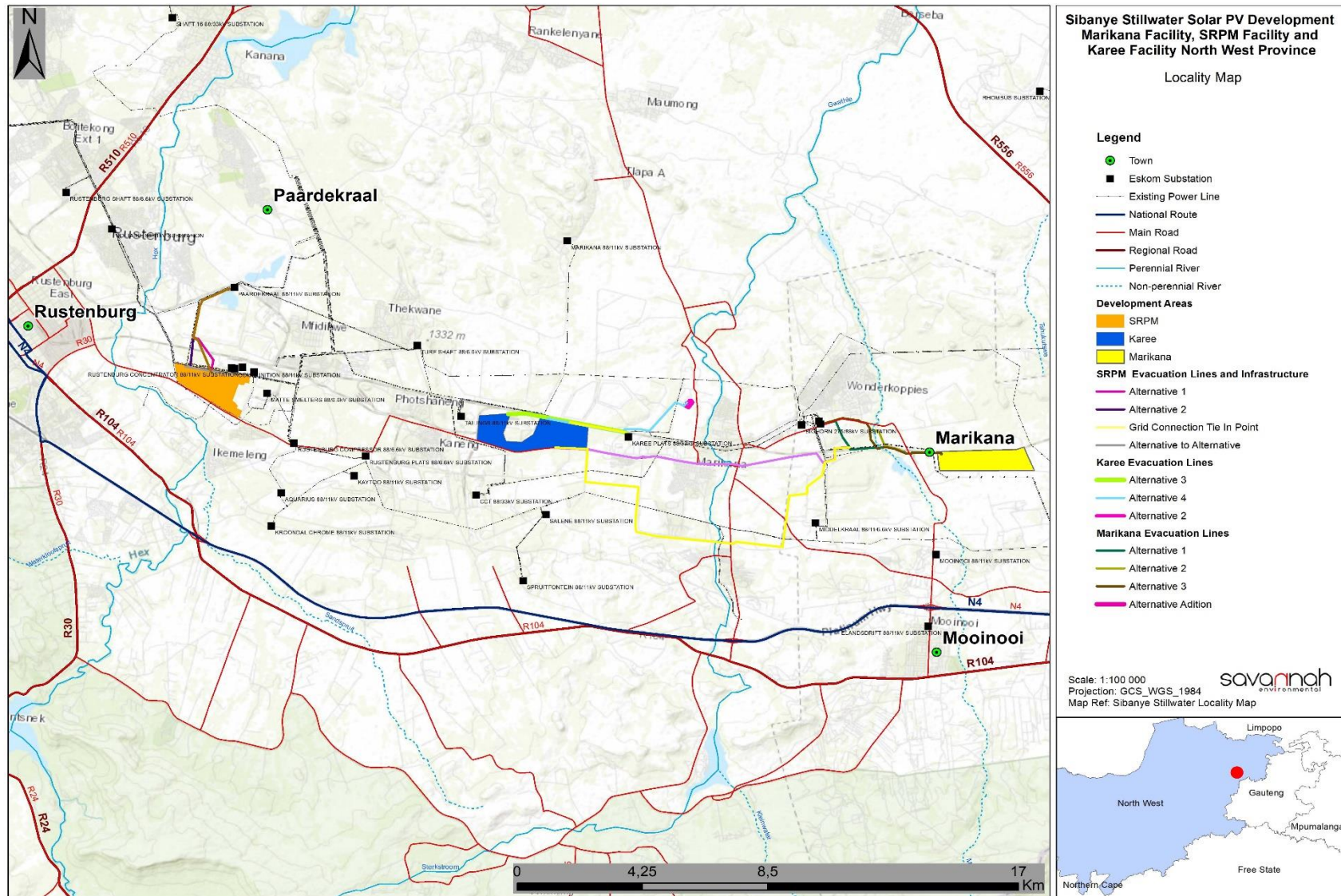
Section 24 of South Africa's National Environmental Management Act (No. 107 of 1998) (NEMA) pertains to Environmental Authorisations (EA), and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the Competent Authority. The 2014 (As amended in 2017) Environmental Impact Assessment (EIA) Regulations, as amended (GNR 326) published under NEMA prescribe the process to be followed when applying for Environmental Authorisation (EA), while the Listing Notices (Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325), and Listing Notice 3 (GNR 324)) contain those activities which may not commence without Environmental Authorisation from the Competent Authority.

Various aspects of the MARIKANA Solar PV Facility are listed as activities that may have a detrimental impact on the environment. The primary listed activity triggered by MARIKANA Solar PV Facility is Activity 1 of Listing Notice 2 (GN R325) which relates to the development of facilities or infrastructure for the generation of electricity from a renewable resource where the generating capacity is 20MW or more. The MARIKANA Solar PV Facility will have a contracted capacity of 30MW.

The MARIKANA Solar PV Facility requires Environmental Authorisation subject to the completion of a full Scoping and Environmental Impact Assessment (S&EIA), as prescribed in Regulations 21 to 24 of the 2014 (amended in 2017) EIA Regulations (GNR 326). The generated electricity will not be fed into the national grid and will be for private use by the MARIKANA Mining facility. Therefore, the project does not classify as part of the Integrated Resource Plan for Electricity (IRP) and the North West Department of Economic Development, Environment, Conservation and Tourism have been identified as the relevant Competent Authority.



**Figure 1.2:** Locality map illustrating the location of the MARIKANA Solar PV Facility and associated infrastructure ((also refer to **Appendix I**).



**Figure 1.3:** Locality map illustrating the three proposed renewable energy facilities proposed by Sibanye Stillwater (refer to **Appendix I** for A3 map)

## 1.2. Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This Scoping Report has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (and amended on 07 April 2017) promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998). This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of Scoping Report:

Requirement	Relevant Section
(a)(i) the details of the EAP who prepared the report and (ii) the expertise of the EAP to carry out scoping procedures; including a curriculum vitae	The details of the EAP and the expertise of the EAP have been included in <b>Section 1.5</b> . The Curriculum vitae of the Savannah Environmental team have been included as <b>Appendix A</b> .
(b) the location of the activity, including (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties	The location of the MARIKANA Solar PV has been included as <b>Figure 1.1</b> . The details of the affected properties, including the property names and numbers, as well as the SG-codes are included in <b>Table 1.1</b> .
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description, and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken	A locality map illustrating the location of the MARIKANA Solar PV has been included in <b>Figure 1.1</b> . The centre point co-ordinates of the project site are included in <b>Table 1.1</b> .

This Scoping Report consists of nine chapters, which include the following:

- » **Chapter 1** provides background to the MARIKANA Solar PV Facility project and the environmental impact assessment.
- » **Chapter 2** provides a project description of the MARIKANA Solar PV Facility project.
- » **Chapter 3** provides the site selection information and identified project alternatives.
- » **Chapter 4** outlines strategic regulatory and legal context for energy planning in South Africa and specifically for the proposed facility as well as describes the need and desirability of MARIKANA Solar PV Facility.
- » **Chapter 5** outlines the process which was followed during the scoping phase of the EIA process.
- » **Chapter 6** describes the existing biophysical and social environment within and surrounding the study and development area.
- » **Chapter 7** provides an identification and evaluation of the potential issues associated with the proposed solar PV facility and associated infrastructure.
- » **Chapter 8** presents the conclusions of the scoping evaluation for the MARIKANA Solar PV Facility.
- » **Chapter 9** describes the Plan of Study (PoS) for the EIA phase.
- » **Chapter 10** provides references used to compile the Scoping report.

### 1.3. Project Overview

The Solar PV facility which is being proposed aims to reduce the mine's consumption of grid-supplied power by using solar power. The solar energy facility will be operated by a third-party power producer, which will be procured through a Special Purpose Vehicle (SPV), MARIKANA Solar (Pty) Ltd, which has been set up as a sister company to Sibanye Stillwater in parallel to the procurement process. The SPV is set-up as an independent, third-party renewable power generation company who will supply electricity to Sibanye Stillwater under a power purchase agreement ("PPA") and will be responsible for all permitting required for the project, as well as all other contractual and financial arrangements to construct and operate the project.

The electricity generated by the proposed PV facility will be consumed by the MARIKANA Platinum Mine. This would provide cost savings to the MARIKANA platinum mine, compared to the current Eskom tariff. In addition to cost saving, the overall electricity demand from the mine places' strain on the national grid, therefore, in an effort to reduce the electricity load and to operate efficiently with uninterrupted power the solar power solution will be implemented.

The project site has been identified by the applicant as a technically feasible site which has the potential for the development of a solar PV facility, including a Battery Energy Storage System (BESS). A development area of approximately 220 ha has been identified within the project site for the development of MARIKANA Solar PV Facility. The full extent of the development area has been considered within this Scoping Report with the aim of determining the suitability from an environmental and social perspective and identifying areas that should be avoided in development planning.

Under the 2015 Paris Agreement, 195 countries pledged to limit global warming to well below 2.0°C, and ideally not more than 1.5°C above preindustrial levels. That target, if pursued, would manifest in decarbonization across industries, creating major shifts in commodity demand for the mining industry and likely resulting in declining global mining revenue pools. Mining-portfolio evaluation must now account for potential decarbonization of other sectors.

South Africa's mining sector is a key socio-economic contributor. To remain competitive globally, it will need to decarbonise, respond to shifting value pools, and adapt to local climate change impacts – while ensuring a Just Transition. This is the central finding of the “Decarbonising South Africa's Mining Sector – towards a Green Technology-driven Mining Ecosystem” report. The report shows that South Africa can decarbonise its mining sector and promote socio-economic development via enabling cross-sector green-tech opportunities.

The biggest mining sector decarbonisation lever is a cleaner electricity supply, eliminating ~75% of Scope 1 and 2 emissions, while electrification of mobility and stationery machinery would eliminate ~15% of Scope 1 and 2 emissions. A coal phase out would remove the majority of fugitive emissions, gases, and vapours. Meeting the Department of Mineral Resources and Energy (DMRE) target of 4 – 5% of global exploration expenditure (~R8-billion per annum) by 2026 is key as it would drive the exploration of green tech commodities in South Africa. In addition, establishing the policy environment and infrastructure to enable increased local beneficiation is key.

Overcoming structural issues, establishing an enabling policy environment, and setting a clear path towards decarbonised operations and production of clean tech commodities would allow South Africa's mining

sector to be a prime destination for global long-term investments in the context of a Just Transition to net-zero in South Africa.

Consequently, Sibanye Stillwater is now embracing their role as stewards of the planet by championing the lowering of greenhouse gas (GHG) emissions and reducing the carbon impact on climate change. This decarbonization is a means to reduce their cost of capital via enhanced access to the growing pool of sustainability-linked funding by investors focused on environmental, social and governance (ESG) factors

Within this identified development area, a development footprint or facility layout will be defined based on the findings of the Scoping Study and will be further assessed during the EIA Phase. Therefore, the exact location of the development footprint within the development area for the MARIKANA Solar PV Facility is not defined at this stage. The development footprint/facility layout is estimated to require an area of which is less than the identified project site in extent (for the 30MW PV facility, including a BESS, and all associated infrastructure) and therefore provides the opportunity for the optimal placement of the infrastructure, ensuring avoidance of major identified environmental sensitivities or constraints identified through this Scoping and EIA process. The extent of the development footprint will be confirmed in the EIA Phase once the layout design is available. The development area is larger than the area needed for the development footprint of an 30MW PV facility.

**Table 1.1:** Detailed description of the project site

<b>Province</b>	<b>North West Province</b>
<b>District Municipality</b>	Bojanala Platinum District Municipality
<b>Local Municipality</b>	Rustenburg Local Municipality
<b>Ward Number (s)</b>	Ward 26 and ward 32
<b>Nearest town(s)</b>	8km east from the town of Marikana
<b>Farm name(s) and number(s) of properties affected by the Solar Facility</b>	Portion 9 of Farm Middelkraal No. 466
<b>Current zoning</b>	Mining
<b>PV Development Footprint</b>	100 hectares
<b>PV Development Area</b>	To be confirmed in EIA phase
<b>Site Coordinates (centre of affected property)</b>	<b>- 25°41'36.74"S , 27°25'13.20"E</b>

Infrastructure associated with the solar PV facility will include:

- » Solar PV array comprising bifacial PV modules and mounting structures, using single axis tracking technology. Once installed will stand up to 5m above ground level.
- » Inverters and transformers.
- » Cabling between the project components.
- » Balance of Plant
- » On-site facility substation to facilitate the connection between the solar PV facility and Eskom electricity grid. The Size and Capacity of the on-site stations will be 30MW.
- » An onsite medium voltage (MV) switching station forming part of the collector substation
- » 100MWh Battery Energy Storage System (BESS) per site
- » Temporary Laydown areas.
- » Access roads, internal roads and fencing around the development area.
- » Up to 132kV Overhead Power Lines (OHPL) – maximum of 30m height with a 15m servitude width
- » Underground LV cabling will be used on the PV site

The overarching objective for the MARIKANA Solar PV Facility is to maximise electricity production through exposure to the available solar resource, while minimising infrastructure, operational and maintenance costs, as well as potential social and environmental impacts. To meet these objectives, local level environmental and planning issues will be assessed through the EIA process with the aid of site-specific specialist studies to delineate areas of sensitivity within the identified project site. This will serve to inform and optimise the design of the solar PV facility.

#### **1.4. Overview of this Environmental Impact Assessment (EIA) Process**

An EIA is an effective planning and decision-making tool for the project developer as it allows for the identification and management of potential environmental impacts. It provides the opportunity for the developer to be forewarned of potential environmental issues and allows for the resolution of the issues reported on in the Scoping and EIA reports as well as dialogue with interested and affected parties (I&APs).

The EIA process comprises of two (2) phases (i.e., Scoping and Impact Assessment) and involves the identification and assessment of potential environmental impacts through the undertaking of independent specialist studies, as well as public participation. The processes followed in these two phases is as follows:

- » The **Scoping Phase** includes the identification of potential issues associated with the project through a desktop study (considering existing information), limited field work, and consultation with interested and affected parties and key stakeholders. This phase considers the broader project site to identify and delineate any environmental fatal flaws, no-go and / or sensitive areas. Following a public review period of the Scoping report, this phase culminates in the submission of a final Scoping Report and Plan of Study for the EIA to the CA for consideration and acceptance.
- » The **EIA Phase** involves a detailed assessment of the potentially significant positive and negative impacts (direct, indirect, and cumulative) identified in the Scoping Phase. This phase considers a proposed development footprint within the project site and includes detailed specialist investigations as well as public consultation. Following a public review period of the EIA Report, this phase culminates in the submission of a final EIA Report and an Environmental Management Programme (EMPr), including recommendations of practical and achievable mitigation and management measures, to the CA for final review and decision-making.

#### **1.5. Details of Environmental Assessment Practitioner and Expertise to conduct the S&EIA Process**

In accordance with Regulation 12 of the 2014 EIA Regulations (GNR 326), the applicant has appointed Savannah Environmental (Pty) Ltd as the independent environmental consultant responsible for managing the Application for EA and supporting Scoping and Environmental Impact Assessment (S&EIA) process; inclusive of comprehensive, independent specialist studies. The application for EA and S&EIA process will be managed in accordance with the requirements of NEMA, the 2014 EIA Regulations (GNR 326), and all other relevant applicable legislation.

Neither Savannah Environmental nor any of its specialists are subsidiaries or are affiliated to the applicant. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed facility.

Savannah Environmental is a specialist environmental consulting company providing a holistic environmental management service, including environmental assessment, and planning to ensure

compliance and evaluate the risk of development, and the development and implementation of environmental management tools. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team.

The Savannah Environmental team for this project includes:

- » **Ansoné’ Esterhuizen**, the principal author of this report and the EAP on this project. She is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (2021/3909), and she holds a Bachelor of Arts in Environmental Management and is currently completing her BSc Honours in Environmental Management. She has over 4 years of experience in conducting Environmental Impacts Assessments, public participation, and Environmental Management Programme for a wide range of projects including renewable energy projects. She is responsible for overall compilation of the report, this includes specialists’ engagements, reviewing specialists reports and incorporating specialist studies into the Environmental Impact Assessment report and its associated Environmental Management. She is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP), Registration Number (142673)
- » **Jo-Anne Thomas**, the project manager, is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA - 2019/726) and registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP). She provides technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, Environmental Impact Assessment studies, environmental auditing and monitoring, environmental permitting, public participation, Environmental Management Plans and Programmes, environmental policy, strategy and guideline formulation, and integrated environmental management. Her key focus is on integration of the specialist environmental studies and findings into larger engineering-based projects, strategic assessment, and providing practical and achievable environmental management solutions and mitigation measures. Responsibilities for environmental studies include project management (including client and authority liaison and management of specialist teams); review and manipulation of data; identification and assessment of potential negative environmental impacts and benefits; review of specialist studies; and the identification of mitigation measures.
- » **Nicolene Venter**, is a Board Member of IAPSA (International Association for Public Participation South Africa). She holds a Higher Secretarial Diploma and has over 21 years of experience in public participation, stakeholder engagement, awareness creation processes and facilitation of various meetings (focus group, public meetings, workshops, etc.). She is responsible for project management of public participation processes for a wide range of environmental projects across South Africa and neighbouring countries.

To adequately identify and assess potential environmental impacts associated with the proposed MARIKANA Solar PV Facility, the following specialist sub-consultants have provided input into this scoping report:

Specialist	Area of Expertise
Andrew Husted of The Biodiversity Company	Ecology, Freshwater, and Soils
Lindi Steyn	Avifauna
Lourens du Plessis of LoGIS	Visual



Tony Barbour of Tony Barbour Environmental Consulting	Social
Jenna Lavin of CTS Heritage	Heritage (including Archaeology Palaeontology and Cultural Landscape)
Iris Wink of JG Afrika	Traffic

**Appendix A** includes the curricula vitae for the environmental assessment practitioners from Savannah Environmental and the specialist consultants.

## CHAPTER 2 PROJECT DESCRIPTION

This Chapter provides an overview of the MARIKANA Solar PV Facility and details the project scope which includes the planning/design, construction, operation, and decommissioning activities required for the development. It must be noted that the project description presented in this Chapter may change to some extent based on the outcomes and recommendations of detailed engineering and other technical studies, the findings and recommendations of the EIA and supporting specialist studies, and any licencing, permitting, and legislative requirements.

### 2.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
3(b) the location of the activity including (i) the 21-digit Surveyor General code of each cadastral land parcel, (ii) where available the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	The location of the proposed project is detailed in Chapter 1, <b>Table 1.1</b> , as well as in <b>section 2.2.1</b> .
3(d)(ii) a description of the scope of the proposed activity, including a description of the activities to be undertaken including associated structures and infrastructure	A description of the activities to be undertaken with the development of the project is included in <b>Table 2.1</b> and <b>Table 2.2</b> .

### 2.2. Nature and Extent of the MARIKANA Solar PV Facility

#### 2.2.1. Overview of the Project Site and planned Infrastructure

As detailed above, the development of renewable energy facilities is proposed by various Special Purpose Vehicles (SPVs). The overall project entails the development of three (3) separate solar PV facilities with a combined contracted capacity of up to 205MW and will be known as SRPM Solar PV, Marikana Solar PV, and Marikana Solar PV respectively, each including a grid connection and other associated infrastructure.

The MARIKANA Solar PV facility is based near current Sibanye Stillwater mining operations ~8km east from the town of Marikana within the Rustenburg Local Municipality and within the greater Bonjanala Platinum District Municipality, North West Province. The project will tie-in to the electricity grid behind the Eskom meter at the respective Sibanye customer substations.

In support of the Paris Agreement and the United Nations Sustainable Development Goals, Sibanye-Stillwater has set a goal to achieve carbon neutrality emissions by 2040 as part of our Environmental, Social and Governance (ESG) strategy. This commitment is underpinned by their energy and decarbonisation strategy and associated interventions. Coal and gas-based electricity contributes to 92% of our Scope 1 and 2 carbon emissions. Replacement of this electricity with renewable alternatives thus forms Sibanye's primary

decarbonisation lever. By 2030, the company aims to have a minimum of 20% of electricity requirements provided from renewable energy sources.

High and volatile energy costs is also a key concern to the mining industry where above-inflation cost escalations and production interruptions threaten the sustainability of their operations. The uncertainty around energy cost escalations in South Africa, underpinned by severe Eskom financial constraints, is compounded by concerns about the reliability of energy supply. Adoption of renewable energy, inclusive of solar and wind, also partially mitigates these operational risks and in turn improves the sustainability of Sibanye's operations.

- » Marikana - Karee complex – 95 MW peak
- » Marikana – Wonderkop substation (Smelter and Base Metal Refinery) - 30MW peak

The details on the PV Facilities and grid connection infrastructure are listed below:

**PV facilities:**

Applicant	Project Name	Generating capacity	Farm Name and No.	Portion No.
MARIKANA Solar (Pty) Ltd	Marikana Solar PV	30MW	Farm Middelkraal No. 466	9

**Grid connection infrastructure**

Applicant	Project Name	Capacity	Farm Name/s and no/s.	Alternatives	Infrastructure components
MARIKANA Solar (Pty) Ltd	Marikana Solar PV	88Kv	Farm Middelkraal No. 466 Portions 9, 12, 7, 36, 5, 3	<ul style="list-style-type: none"> <li>» Alternative 1: farm Middelkraal 466, Portions 9, 12, 7, 15, 14, 3</li> <li>» Alternative 2: farm Middelkraal 466, RE/9, 12, 7, 15, 14, RE/3.</li> <li>» Alternative 3: farm Middelkraal 466: RE/9, 12, 7, 36, RE/5, River crossing, 18, RE/3.</li> <li>» Alternative addition to Alternative 1 to reach tie in point: RE/3.</li> </ul>	Power line to the Wonderkop substation

The project site can be accessed via the N24 and route 66 (refer to **Figure 2.1**), additionally the site can be accessed via an unnamed road from Photshaneng (**Figure 2.2**).

Grid connection infrastructure for the PV facility will be located outside the PV development area but, within the project site within a 300m corridor. This grid connection infrastructure is to be assessed in this scoping EIA.



**Figure 2.1:** Location of the national road in relation to the MARIKANA Solar PV Facility development area (development area in orange).

**Figure 2.2:** Location of the development area in relation to the access road which provides direct access to the project site and development area.

Once environmentally constraining factors have been identified through the EIA process, the layout of the PV facility and associated infrastructures will be determined. The layout will take into consideration any environmentally sensitive areas identified through the EIA process and the PV panels and associated infrastructures will be appropriately placed. A more accurate understanding of the final development footprint will be determined during the EIA phase with the availability of a facility layout plan.

### **2.2.2. Components of the MARIKANA Solar PV Facility**

The project site is proposed to accommodate both the PV panels and most of the associated infrastructure which is required for such a facility the solar PV facility will include the following:

- » Solar PV array comprising bifacial PV modules and mounting structures, using single axis tracking technology. Once installed will stand up to 5m above ground level.
- » Inverters and transformers.
- » Cabling between the project components.
- » Balance of Plant.
- » On-site facility substation to facilitate the connection between the solar PV facility and Eskom electricity grid. The Size and Capacity of each of the on-site stations will be 80MVA, 95MVA and 30MVA respectively.
- » An onsite medium voltage (MV) switching station forming part of the collector substation.
- » 100MWh Battery Energy Storage System (BESS) per site.
- » Temporary Laydown areas.

- » Access roads, internal roads and fencing around the development area.
- » Up to 132kV Overhead Power Lines (OHPL) – maximum of 30m height with a 15m servitude width
- » Underground LV cabling will be used on the PV sites.

A summary of the details and dimensions of the planned infrastructure associated with the project as determined at this stage in the project development is provided in **Table 2.1**

**Table 2.1:** Details or infrastructures proposed as part of MARIKANA Solar PV Facility. Specific details to be confirmed in the EIA phase.

Infrastructure	Footprint and dimensions
Number of Panels	To be determined in the EIA phase
Panel Height	Up to 5m
Technology	Use of fixed-tilt, single-axis tracking, PV technology. Bifacial panels are being considered.
Contracted Capacity	Up to 30MW
Area occupied by the solar array	~100ha
Area occupied by the on-site facility substation	~ 15ha
Capacity of on-site facility substation	88kV
Area occupied by laydown area	~1 ha
Access and internal roads	Wherever possible, existing access roads will be utilised to access the project site and development area. Internal roads of up to 6m in width will be required to access the PV panels and the on-site substation.
Grid connection Works	The power generated by the solar PV facility will be transferred to the on-site/plant substation.
Grid Connection Co ordinates	<u>Beginning: 25°40'35.04"S; 27°18'6.10"E</u>
	<u>Center: 25°39'59.99"S; 27°18'12.50"E</u>
	<u>Curve: 25°39'22.59"S; 27°18'20.32"E</u>
	<u>End: 25°39'3.18"S; 27°19'0.34"E</u>
Temporary infrastructure	Temporary infrastructure, including laydown areas, hardstand areas and a concrete batching plant, will be required during the construction phase. All areas affected by temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operation phase.

**Table 2.2** provides details regarding the requirements and the activities to be undertaken during the MARIKANA Solar PV Facility development phases (i.e., construction phase, operation phase and decommissioning phase). **Section 2.3** provides illustrations of technology considered for the solar energy facility and the generation of electricity.

### 2.2.3. Project Development Phases Associated with the MARIKANA Solar PV facility

**Table 2.2:** Details of the MARIKANA Solar PV Facility project development phases (i.e., construction, operation, and decommissioning)

<b>Construction Phase</b>	
<b>Requirements</b>	<ul style="list-style-type: none"> <li>» Project receives Environmental Authorisation from the DEDECT, Mine is a private offtake of electricity, a generating license issued by NERSA, and a Power Purchase Agreement secured with Eskom (or private entity).</li> <li>» Expected to be 15-18 months for MARIKANA Solar PV Facility.</li> <li>» The construction phase involves installation of the solar PV panels and the structural and electrical infrastructure to make the plant operational. In addition, preparation of the soil and improvement of the access roads would continue for most of the construction phase.</li> <li>» Create direct construction employment opportunities. Approximately 350 employment opportunities will be created.</li> <li>» No on-site labour camps. Employees to be accommodated in the nearby towns such as Richmond and Victoria West and transported to and from site on a daily basis.</li> <li>» Overnight on-site worker presence would be limited to security staff.</li> <li>» Waste removal and sanitation will be undertaken by a suitably qualified sub-contractor. Waste containers, including containers for hazardous waste, will be located at easily accessible locations on site when construction activities are undertaken.</li> <li>» Electricity required for construction activities will be generated by a generator. Where low voltage connections are possible, these will be considered.</li> <li>» Water required for the construction phase will be supplied by the municipality. In addition, in addition, and where the Municipality is unable to provide sufficient water, borehole water will be used. Should water availability at the time of construction be limited, water will be transported to site via water tanks. Water will be used for sanitation and potable water on site as well as construction works.</li> </ul>
<b>Activities to be undertaken</b>	
Conduct surveys prior to construction	<ul style="list-style-type: none"> <li>» Including, but not limited to a geotechnical survey, site survey and confirmation of the panel micro-siting footprint, and survey of the on-site collector substation site to determine and confirm the locations of all associated infrastructure.</li> </ul>
Establishment of access roads to the Site	<ul style="list-style-type: none"> <li>» Internal access roads within the site will be established at the commencement of construction.</li> <li>» Existing access roads will be utilised, where possible, to minimise impact. It is unlikely that access roads will need to be upgraded as part of the proposed development.</li> <li>» Access roads to be established for construction and/or maintenance activities within the development footprint.</li> <li>» Internal service road alignment will be approximately 6m wide. Location is to be determined by the final micro-siting or positioning of the PV panels.</li> </ul>

Undertake site preparation	<ul style="list-style-type: none"> <li>» Including the clearance of vegetation at the footprint of PV panel supports, establishment of the laydown areas, the establishment of internal access roads and excavations for foundations.</li> <li>» Stripping of topsoil to be stockpiled, for use during rehabilitation.</li> <li>» Vegetation clearance to be undertaken in a systematic manner to reduce the risk of exposed ground being subjected erosion.</li> <li>» Include search and rescue of floral species of concern (where required) and the identification and excavation of any sites of cultural/heritage value (where required).</li> </ul>
Establishment of laydown areas and batching plant on site	<ul style="list-style-type: none"> <li>» A laydown area for the storage of PV panels components and civil engineering construction equipment.</li> <li>» The laydown will also accommodate building materials and equipment associated with the construction of buildings.</li> <li>» No borrow pits will be required. Infilling or depositing materials will be sourced from licenced borrow pits within the surrounding areas.</li> <li>» A temporary concrete batching plant of 50m x 50m in extent to facilitate the concrete requirements for foundations, if required.</li> </ul>
Construct foundation	<ul style="list-style-type: none"> <li>» Excavations to be undertaken mechanically.</li> <li>» For PV array installation vertical support posts will be driven into the ground.</li> <li>» Depending on geological conditions, the use of alternative foundations may be considered (e.g., screw pile, helical pile, micropyle or drilled post/piles).</li> </ul>
Transport of components and equipment to and within the site	<ul style="list-style-type: none"> <li>» The components for the solar PV facility and onsite substation will be transported to site by road. Transportation will take place via appropriate National and Provincial roads, and the dedicated access/haul road to the site.</li> <li>» Some of the components (i.e., substation transformer) may be defined as abnormal loads in terms of the Road Traffic Act (Act No. 29 of 1989) by virtue of the dimensional limitations.</li> <li>» Typical civil engineering construction equipment will need to be brought to the site (e.g., excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the PV support structures, construction of the substation and site preparation.</li> </ul>
Erect PV Panels and Construct Substation, Invertors and BESS	<ul style="list-style-type: none"> <li>» For array installation, typically vertical support posts are driven into the ground. Depending on the results of the geotechnical study a different foundation method, such as screw pile, helical pile, micro-pile or drilled post/pile could be used. The posts will hold the support structures (tables) on which PV arrays would be mounted. Brackets attach the PV modules to the tables.</li> <li>» Trenches are dug for the underground AC and DC cabling and the foundations of the inverter enclosures and transformers are prepared.</li> <li>» While cables are being laid and combiner boxes are being installed, the PV tables are erected.</li> <li>» Wire harnesses connect the PV modules to the electrical collection systems. Underground cables and overhead circuits connect the Power Conversion Stations (PCS) to the on-site AC electrical infrastructure and ultimately the project's on-site substation.</li> </ul>

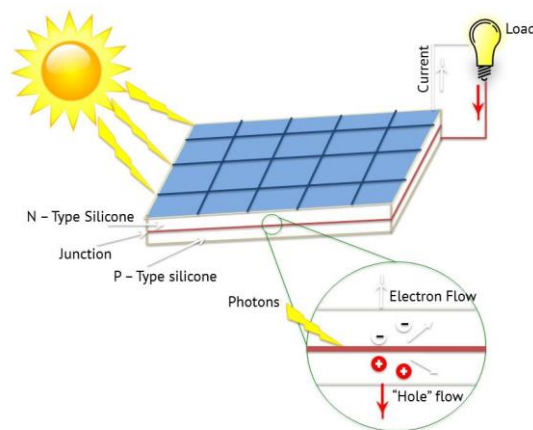
	<ul style="list-style-type: none"> <li>» This process also involves the installation of the BESS facility.</li> </ul>
Connection of PV panels to the substation	<ul style="list-style-type: none"> <li>» PV arrays to be connected to the on-site substation via underground electrical cables.</li> <li>» Excavation of trenches is required for the installation of the cables. Trenches will be approximately 1.5m deep.</li> <li>» Underground cables are planned to follow the internal access roads, as far as possible.</li> <li>» Onsite substation to be connected to the collector substation via underground cables.</li> </ul>
Establishment of ancillary infrastructure	<ul style="list-style-type: none"> <li>» Site offices and maintenance buildings, including workshop areas for maintenance and storage will be required.</li> <li>» Establishment will require the clearing of vegetation, levelling, and the excavation of foundations prior to construction.</li> </ul>
Connect substation to the power grid	<ul style="list-style-type: none"> <li>» Up to a 132kV single circuit power line will run from the onsite IPP substation and the Switching station and tie into the Wonderkop substation.</li> </ul>
Undertake site rehabilitation	<ul style="list-style-type: none"> <li>» Commence with rehabilitation efforts once construction completed in an area, and all construction equipment is removed.</li> <li>» On commissioning, access points to the site not required during the operation phase will be closed and prepared for rehabilitation.</li> </ul>
<b><u>Operation Phase</u></b>	
<b>Requirements</b>	<ul style="list-style-type: none"> <li>» Duration will be 20-25 years.</li> <li>» Requirements for security and maintenance of the project.</li> <li>» Employment opportunities relating mainly to operation activities and maintenance. Approximately 15 - 20 full-time employment opportunities will be available during the operation of the solar facility.</li> </ul>
<b><u>Activities to be undertaken</u></b>	
Operation and Maintenance	<ul style="list-style-type: none"> <li>» Full time security, maintenance, and control room staff.</li> <li>» All PV panels will be operational except under circumstances of mechanical breakdown, inclement weather conditions, or maintenance activities.</li> <li>» Solar PV to be subject to periodic maintenance and inspection.</li> <li>» It is anticipated that the PV panels will be washed twice a year during operation using clean water with no cleaning products, or non-hazardous biodegradable cleaning products.</li> <li>» Disposal of waste products (e.g., oil) in accordance with relevant waste management legislation.</li> <li>» Areas which were disturbed during the construction phase to be utilised, should a laydown area be required during operation.</li> </ul>
<b><u>Decommissioning Phase</u></b>	
<b>Requirements</b>	<ul style="list-style-type: none"> <li>» Decommissioning of the MARIKANA Solar PV Facility infrastructure at the end of its economic life.</li> <li>» Potential for repowering of the facility, depending on the condition of the facility at the time.</li> <li>» Expected lifespan of approximately 20 - 25 years (with maintenance) before decommissioning is required.</li> <li>» Decommissioning activities to comply with the legislation relevant at the time.</li> </ul>



	<ul style="list-style-type: none"> <li>» It is expected that the areas of the project site affected by the solar facility infrastructure (development footprint) will revert back to its original land-use (i.e., agriculture) once the MARIKANA PV facility has reached the end of its economic life and all infrastructure has been decommissioned.</li> </ul>
<p><b>Activities to be undertaken</b></p>	
<p>Site preparation</p>	<ul style="list-style-type: none"> <li>» Confirming the integrity of site access to the site to accommodate the required decommissioning equipment.</li> <li>» Preparation of the site (e.g., laydown areas and construction platform).</li> <li>» Mobilisation of construction equipment.</li> </ul>
<p>Disassemble and remove PV panels</p>	<ul style="list-style-type: none"> <li>» Components to be reused, recycled, or disposed of in accordance with regulatory requirements.</li> <li>» 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.</li> <li>» Concrete will be removed to a depth as defined by an agricultural specialist and the area rehabilitated.</li> <li>» Cables will be excavated and removed, as may be required</li> </ul>

### 2.3. Technology considered for the Solar Energy Facility and the Generation of Electricity

MARIKANA Solar PV Facility will have a contracted capacity of up to 30MW and will make use of PV technology. Solar energy facilities, which utilise PV technology, 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 (refer to **Figure 2.3**).



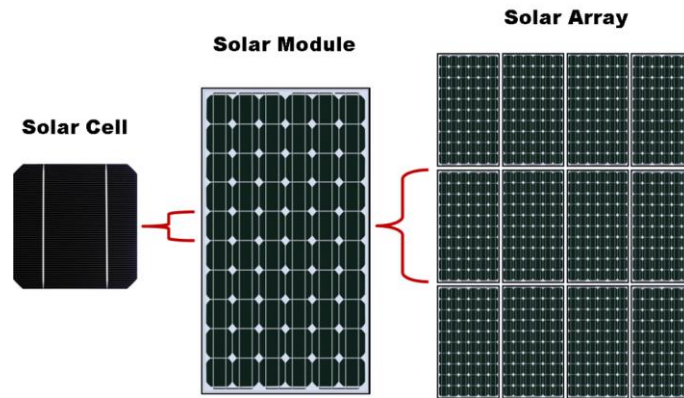
**Figure 2.3:** Diagram illustrating the Photovoltaic Effect (Source: Centre for Sustainable Energy)

The Photovoltaic Effect is achieved through the use of the following components:

#### **Photovoltaic Cells**

A PV cell is made of silicone that acts as a semi-conductor used to produce the Photovoltaic Effect. PV cells are arranged in multiples / arrays and placed behind a protective glass sheet to form a PV panel (refer to **Figure 2.4**). 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)).

<sup>1</sup> DC (direct current) is the unidirectional flow or movement of electric charge carriers (which are usually electrons). The intensity of the current can vary with time, but the general direction of movement stays the same at all times. As an adjective, the term DC is used in reference to voltage whose polarity never reverses. In a DC circuit, electrons emerge from the negative, or minus, pole and move towards the positive, or plus, pole. Nevertheless, physicists define DC as traveling from plus to minus. (Sourced from <https://whatis.techtarget.com/definition/DC-direct-current>).

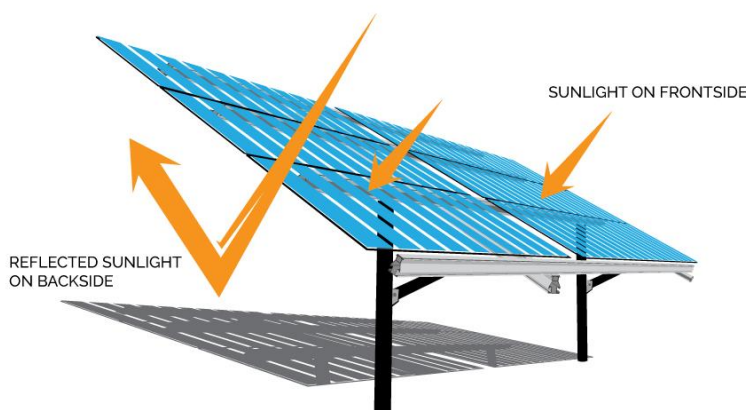


**Figure 2.4:** Overview of a PV cell, module, and array / panel (Source: pveducation.com)

### **Bifacial Solar Panel Technology**

Fountain PV (Pty) Ltd is considering the use of bifacial tracking technology. Bifacial (“two-faced”) modules produce solar power from both sides of the panel. Traditional solar panels capture sunlight on one light-absorbing side. The light energy that cannot be captured is simply reflected away. 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 2.5). 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.

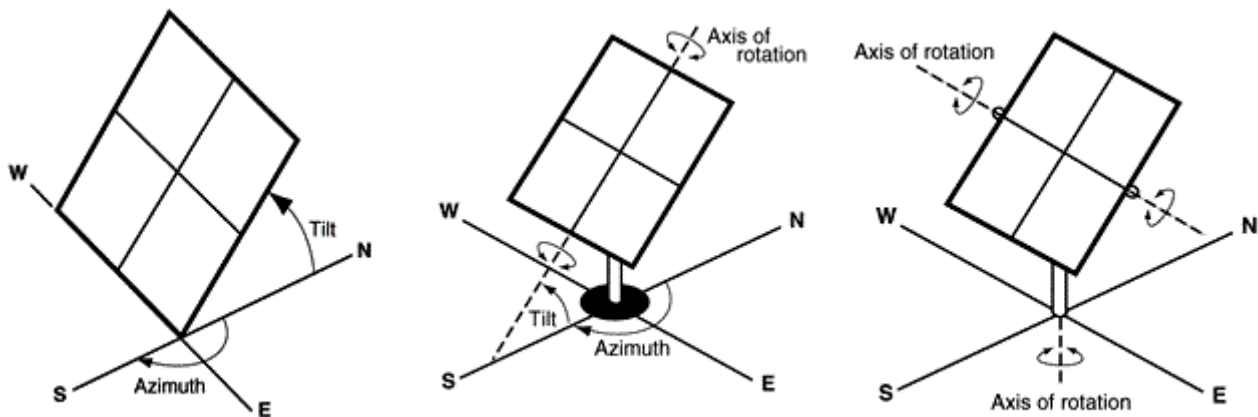
The optimum tilt for a bifacial module has to be designed so as to capture a big fraction of the reflected irradiation. Use of trackers is recommended so the modules can track the sun’s movement across the sky, enabling them to stay directed to receive the maximum possible sunlight to generate power.



**Figure 2.5:** Diagram showing how bifacial Solar PV panels work (Source: <https://sinovoltaics.com/learning-center/solar-cells/bifacial-solar-modules/>)

### **Support Structures**

PV panels will be fixed to a support structure. PV panels can either utilise fixed/static support structures, or single or double axis tracking support structures (refer to **Figure 2.5**). PV panels which utilise fixed/static support structures are set at an angle (fixed-tilt PV system) so as 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 which utilise tracking support structures track the movement of the sun throughout the day so as to receive the maximum amount of solar irradiation.



**Figure 2.5:** Overview of different PV tracking systems (from left to right: fixed-tilt, single-axis tracking, and double-axis tracking (Source: pveducation.com)).

PV panels are designed to operate continuously for more than 25 years, mostly unattended and with low maintenance.

### Battery Energy Storage System (BESS)

The need for a BESS stem from the fact that electricity is only produced by the Renewable Energy Facility while the sun is shining, while the peak demand may not necessarily occur during the daytime. Therefore, the storage of electricity and supply thereof during peak-demand will mean that the facility is more efficient, reliable and electricity supply more constant.

The BESS will:

- » Store and integrate a greater amount of renewable energy from the Solar PV Facilities into the electricity grid;
- » Proposed footprint of battery storage area: Approx. 0.5ha
- » Proposed preferred technology to be used: The main technologies to be considered, either separately or in combination:
  - \* Lithium-ion batteries (LFP/NMC or others) (Li-Ion)
  - \* Lithium capacitors/Electrochemical capacitors (LiC)
  - \* (LFP/NMC or others) (Li-Ion), Lithium capacitors/Electrochemical capacitors (LiC), Redox-flow batteries (RFB) and/
  - \* or Sodium Sulphur batteries (NaS).

## CHAPTER 3 CONSIDERATION OF ALTERNATIVES

This Chapter provides an overview of the various alternatives considered for MARIKANA Solar PV Facility as part of the Scoping Process.

### 3.1. Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
3(g) a motivation for the preferred site, activity, and technology alternative	The identification and motivation for the preferred project site, the development area within the project site, the proposed activity and the proposed technology is included in sections <b>3.3.1</b> , <b>3.3.3</b> and <b>3.3.4</b> .
3(h)(i) details of the alternative considered	The details of all alternatives considered as part of the MARIKANA Solar PV Facility are included in sections <b>3.3.1 – 3.3.5</b> .
3(h)(ix) the outcome of the site selection matrix	The site selection process followed by the developer to identify the preferred project site and development area is described in section <b>3.3.1</b> .
3(h)(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such	Where no alternatives have been considered, motivation has been included. This is included in section <b>3.3</b> .

### 3.2. Alternatives Considered during the Scoping Process

In accordance with the requirements of Appendix 2 of the 2014 Environmental Impact Assessment (EIA) Regulations (As amended) (GNR 326), reasonable and feasible alternatives including but not limited to site and technology alternatives, as well as the “do-nothing” alternative should be considered.

The DFFE Guideline for determining alternatives states that the key criteria for consideration when identifying alternatives are that they should be “practicable”, “feasible”, “relevant”, “reasonable” and “viable”. Essentially there are two types of alternatives:

- » Incrementally different (modifications) alternatives to the project.
- » Fundamentally (totally) different alternatives to the project.

In this instance, 'the project' refers to MARIKANA Solar PV Facility, a solar energy facility with capacity of up to 30MW and associated infrastructure proposed to be developed by an Independent Power Producer (IPP) and intended to form part of Sibanye Stillwater's strategic shift to decarbonization in the mining industry.

#### **4.2.1. Consideration of Fundamentally Different Alternatives**

Fundamentally different alternatives are usually assessed at a strategic level and, as a result, project specific EIAs are therefore limited in scope and ability to address fundamentally different alternatives. At a strategic level, electricity generating alternatives have been addressed as part of the DMRE's current Integrated Resource Plan for Electricity 2010 – 2030 (IRP)<sup>2</sup>, and will continue to be addressed as part of future revisions.

In this regard, the need for renewable energy power generation from solar PV facilities has been identified as part of the technology mix for power generation in the country for the next 20 years. Of relevance to the proposed project is the IRP 2019 which outlines South Africa's stepping stones to reduce coal's contribution to the energy mix to below 60%, in favour of renewables like wind, and PV technologies, which would account for 25% of the country's energy mix by 2030, furthermore the DMRE plans to repurpose existing coal-fired plants with renewable energy plants and/or battery storage solutions, and training people in new skills to ensure that jobs can be transferred. The IRP includes provision for distributed generation capacity for own use. The threshold for distributed generation was raised to 100 MW in August 2021. Project developers are exempted from applying for a license but are required to register with the National Energy Regulator of South Africa (NERSA) and comply with the relevant grid code(s).

The fundamental energy generation alternatives were assessed and considered within the development of the IRP and the need for the development of renewable energy projects has been defined. Therefore, fundamentally different alternatives to the proposed project are not considered within this EIA process.

#### **4.2.2. Consideration of Incrementally Different Alternatives**

Incrementally different alternatives relate specifically to the project under investigation. "Alternatives", in relation to a proposed activity, means different ways of meeting the general purposes and requirements of the activity, which may include alternatives for:

- » The property on which, or location where the activity is proposed to be undertaken.
- » The type of activity to be undertaken.
- » The design or layout of the activity.
- » The technology to be used in the activity.
- » The operational aspects of the activity.

In addition, the option of not implementing the activity (i.e., the "do-nothing" alternative) must also be considered.

The sections below describe the incrementally different alternatives being considered for the development of the MARIKANA Solar PV Facility. Where no alternative is being considered, a motivation has been provided as required by the EIA Regulations, 2014.

### **3.3. Property or Location Alternatives**

The placement of a solar PV facility is dependent on several factors, namely, land suitability, climatic conditions (solar irradiation levels), topography, the location and extent of the development area, availability of grid connection infrastructure, and the need and desirability of the project.

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<sup>2</sup> The Integrated Resource Plan (IRP) is legislated policy which regulates power generation planning.

The MARIKANA Solar PV Facility is located in Rustenburg, within the North West Province, the proposed PV facility will be located within close proximity of the MARIKANA Mine processing plant. The proposed site was previously used for mining related activities, with relevant infrastructure in place, suitable for the proposed PV facility – i.e., fencing, ablutions facilities, storm water control, etc. By utilising an already disturbed area, this would mean minimizing the cumulative environmental impacts. Furthermore, with the site being near the existing Mine substation, ensures that the power line will be relatively short, saving on costs and further reducing cumulative environmental impacts.

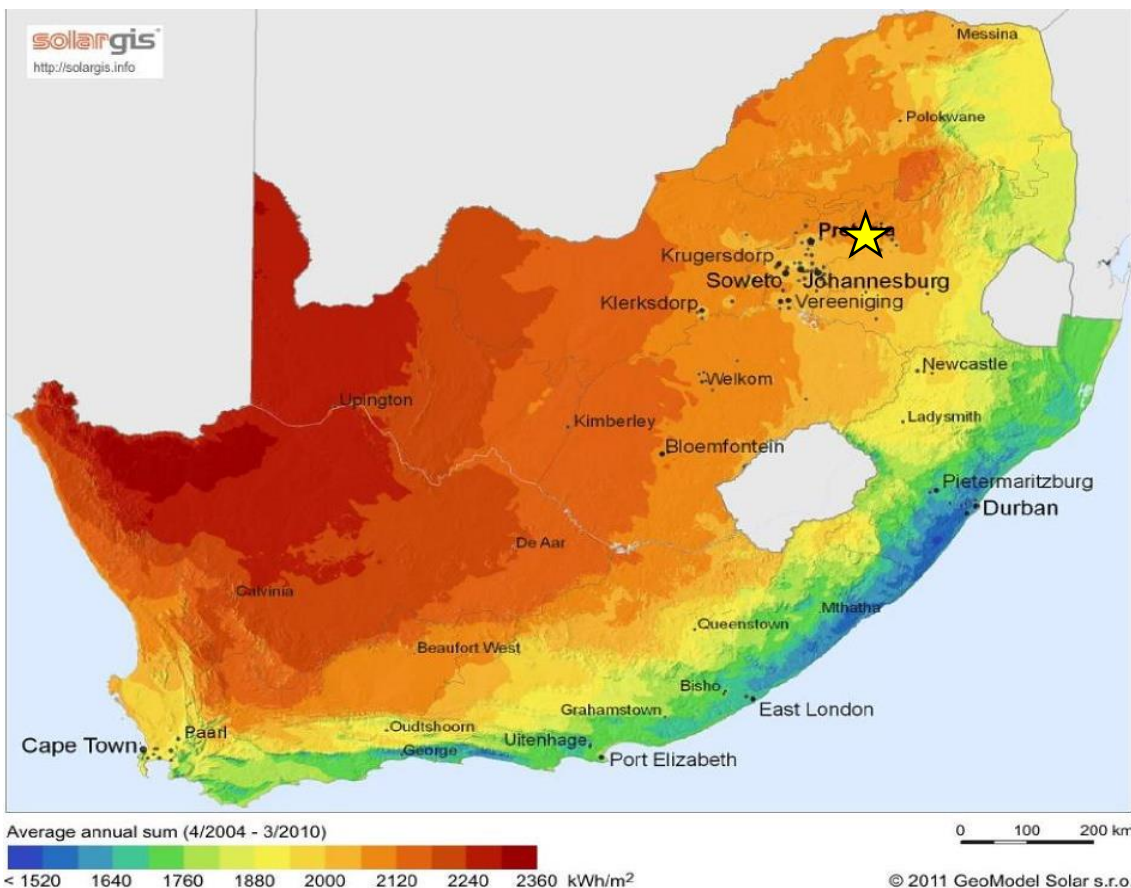
The preferred project site was further evaluated and identified through the investigation of various technical perspectives; the site is highly favourable to establish a Solar PV Facility due to the following site-specific favourable characteristics:

- » Solar resource characteristics (including Global Horizontal Irradiation (GHI)).
- » Land availability.
- » Land use and geographical and topographical considerations.
- » Access to the mine grid tie in point
- » Site accessibility.
- » Environmental and social aspects.

The characteristics considered were identified by the developer as the main aspects that play a role in the opportunities and limitations for the development of a Solar PV facility. The characteristics considered, and the results thereof, are discussed in the sections below.

- » **National and Provincial and Local Planning Considerations** - Renewable energy is strongly supported at a national, provincial, and local level (refer to Chapter 4 for more details). The introduction and adoption of the New Growth Path in South Africa has seen increased emphasis towards developing and growing the green economy within the country, supported among others, by the Industrial Policy Action Plan (IPAP2) of 2010 and revised Integrated Resource Plan (IRP2), additionally the Cabinet approved a number of key supportive policies. The policies in question included the Medium-term Strategic Framework (MTSF) 2009–2014, the Ten-year Innovation Plan, the revised Industrial Policy Action Plan for 2010/11–2012/13 (IPAP2), and others mentioned previously. Nationally, the development and investment in renewable energy is further supported by the National Development Plan (NDP), New Growth Path Framework and National Infrastructure Plan, which all refer to renewable energy, there is also a White Paper on Renewable Energy which has been adopted by Parliament.
- » **National and Provincial Sustainable Energy Programs** - Various funding mechanisms and programmes related to renewable energy have also been considered. One of these, the Independent Power Producer Procurement Programme contributes substantially towards socio-economic and environmentally sustainable growth. It is also aimed at stimulating the renewable energy industry in South Africa. This programme has opened the market for RE substantially in South Africa and holds sustainable potential for the North West Province. The Green Energy Efficiency Fund supports the introduction of self-use renewable energy technologies. Also available are the South African Renewables Initiative and the Renewable Energy Market Transformation Project. There are also a number of mechanisms that support renewable energy production linked to domestic manufacturing and the use of green technologies such as the Manufacturing Competitiveness Enhancement Programme. The Solar Water Heater Rebate programme is also one of the well-known mechanisms currently active.

- » **Solar resource:** The north and north-western parts of South Africa have the highest Global Horizontal Irradiation (GHI), relevant to PV installations and Direct Normal Irradiance (DNI), relevant to CPV and tracking PV installations. Therefore, this area of South Africa is deemed the most suitable for the construction and operation of solar energy facilities as opposed to other areas and provinces within South Africa. For example, coastal regions within KwaZulu-Natal, Eastern Cape and Western Cape mainly have a solar radiation between 1500 kWh/m<sup>2</sup> and 1700 kWh/m<sup>2</sup> per annum, which is not completely feasible for the proposed projects. The NWP in particular has a very good solar potential with an average daily solar radiation greater than 8,000 MJ/m<sup>2</sup>. Compared to a location such as Upington, which is considered a prime location for solar energy projects and also located within the area of maximum solar radiation, the Bojanala Platinum District Municipalities only receive approximately 11% less solar radiation than Upington. Alternatively, the district municipality on average receive 40% to 32% more solar radiation than the locations with the least solar radiation in South Africa (such as Durban). The North West Province consequently shows considerable potential for solar applications in renewable energy as a whole. Based on the solar resource available the proposed site location was identified as being technically feasible.



**Figure 3.1:** Solar irradiation map for South Africa. The proposed MARIKANA Solar PV Facility site is shown by the yellow star on the map. (Source: adapted from GeoModel Solar, 2011).

- » **Land availability:** The availability of land is a key feasibility criterion in the site selection process. The project site is of a suitable land size for the proposed development. Furthermore, this region is home to some of the biggest mining operations in the country, and most land parcels have been given mining rights. Thus, there is very limited land available for the development of renewable energy facilities where potential land use conflicts do not exist. The proponent has however secured sufficient land for the



development of the proposed solar energy facility on portions of land not affected by or earmarked for mining development.

To develop the MARIKANA Solar PV Facility with a contracted capacity of up to 30MW, sufficient space is required. The property included in the project site is privately-owned and is available for a development of this nature through agreement with the landowner, and is deemed technically feasible by the project developer for such development to take place. An exact development footprint within the development area for the placement of infrastructure will be identified and assessed as part of the EIA Phase considering environmental constraints and sensitivities.

In order to ensure the ease of integration of the new solar facility into the existing mine Transmission network/grid, and considering the environmental impacts associated with this integration, it was determined that the most feasible site would be close to existing power lines and other electrical infrastructure.

- » **Landowner Support:** The selection of a site where the landowner is supportive of the development of renewable energy is essential for ensuring the success of the project. The landowner affected by the proposed MARIKANA Solar PV Facility (i.e. Sibanye Stillwater) does not view the development as a conflict with their current land use practices or future plans. The support from the landowners for the development to be undertaken on the affected properties has been solidified by the provision of consent for the project to proceed on the property through the signing of landowner consent forms which have been submitted together with the EA application.
  
- » **Land use:** The area surrounding the development footprint can be classified as a mix between rural residential and mining activities. Towards the North and Eastern side of the site, previously developed mining infrastructure and buildings are clearly visible, whereas to the south and especially the east more residential areas appear, and the closer to the mine the more rural or informal these dwellings seem to be. Small-scale farming or subsistence farming may be taking place on some of the neighbouring properties which do not belong to any mining company.
  
- » **Geographical and Topographical Considerations:** The topography in the wider area surrounding the project site is characterised by a largely flat to undulating landscape interspersed with areas of high elevation in the form of hills, koppies, ridges and/or mountains. In the wider area, a range of hilly/mountainous topography with high elevations is present to the south-east and north of the site, respectively. As such, there are very few physical constraints present which would influence the construction and operation of a solar PV facility.
  
- » **Site access:** The proposed site is located in Rustenburg, North West province. The road network surrounding the site comprises of the D108, private roads and unnamed roads. Based on TRH26, D108 functions as a rural Class 3 minor arterial. The surrounding road network comprises of surfaced roads with one lane per direction and gravel shoulders. There are no formalised provisions made for pedestrian facilities within the surrounding road network reserve. Access to the project site is possible through the use of three existing Mine access roads. As the site will be accessed via existing access points, access spacing restrictions are not envisaged. Accesses 1 and 3 are located off fairly straight roads thus sight line issues are not envisaged. Access 2 located east of the site connects off a gravel road with a horizontal curve. It is therefore recommended that the gravel access road where Access 02 is located be investigated for redesign to improve horizontal curves to limit sight line restrictions. At

all Access points, it is recommended that vegetation within the road reserve and access sight triangles be kept clear to maintain visibility.

Based on the above considerations, the MARIKANA Solar PV Facility project site was identified by the developer as being the most technically feasible and viable project site within the broader area for further investigation in support of an application for authorisation. As a result, no property/location alternatives are proposed as part of this Scoping and EIA process.

#### **4.3.1. Design and Layout Alternatives**

The overall aim of the facility layout (i.e., development footprint) is to maximise electricity production through exposure to the solar resource, while minimising infrastructure, operation, and maintenance costs, and social and environmental impacts. The suitability of the site from an environmental perspective for the placement of the MARIKANA Solar PV Facility in the area will be determined through the EIA process being undertaken for the facility. The findings of the specialist scoping assessments will assist the developer in selecting the optimum position for the PV arrays and associated infrastructures including, but not limited to, access roads, and laydown areas.

The design layout alternatives will include the consideration of technical constraints (such as roads, fencing and servitudes) and the consideration of sensitive environmental areas and features present as identified by the independent specialists that needs to be avoided by the placement of infrastructure. The total surface area proposed for layout options will include the PV panel arrays spaced to avoid shadowing, access and maintenance roads and associated infrastructure (buildings, power inverters, power lines, BESS, and perimeter fences). With regards to the structure orientation, the panels will either be fixed to a single-axis horizontal tracking structures where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun. The choice of pylon structure to be used for the power line will be determined in consultation with Eskom and does not significantly affect the environmental impacts of the proposed development as provision has already been made for the visual, ecological and heritage impacts of erecting a power line. No defined structure has been confirmed at this stage and will depend on the technical requirements. The power line with a capacity not more than 132kV must be constructed according to the authorised standards for a power line. The structure to be utilised for the power line towers will also be informed by the local geotechnical and topographical conditions.

An overall environmental scoping sensitivity map has been provided to illustrate the sensitive environmental features located within the project site which needs to be considered and, in some instances completely avoided by the development footprint (refer to Chapter 9). Once more detailed information is available from an environmental and planning perspective for the broader site, a detailed micro-siting exercise will be undertaken to effectively 'design' the solar facility layout within the project site, which will be known as the development footprint. Through the process of determining constraining factors and environmentally sensitive areas, the layout of the PV facility footprint and infrastructure will be planned and adjusted if necessary to ensure the avoidance of no-go areas and mitigation of sensitive environmental features. A detailed facility layout will be developed and will be made available for assessment and ground-truthing by the independent specialists in the EIA phase. Where further conflicts are predicted, a mitigation strategy will be developed to meet the objectives of the mitigation hierarchy (avoid, minimise, mitigate).

#### **4.3.2. Activity Alternatives**

In an aim to decarbonize, mines are choosing to move away from coal generated power sources, such as those provided by Eskom. The alternatives to electricity supply from coal in South Africa are renewable energy and nuclear energy. Only renewables are considered as a feasible option for the proposed project due to economic and technical considerations.

Possible reasonable and feasible alternatives in terms of renewable energy for the mine include Solar, Biomass, Hydro Energy and Wind Energy. However, based on the preliminary investigations undertaken by the Project Applicant, no other renewable energy technologies are deemed to be appropriate for the site.

Therefore, the implementation of a solar energy facility at the proposed project site is considered as the most favourable and feasible alternative for further investigation. In terms of project and location compatibility, the proposed solar facility is considered to be the most feasible renewable energy land use alternative. Therefore, only the development of a solar PV facility is considered within this report.

#### **4.3.3. Technology Alternatives**

MARIKANA Solar PV (Pty) Ltd is a renewable energy project developer and as such is only considering renewable energy technologies for the generation of up to 30MW of electricity. The project site is located near the towns of Rustenburg in the North Western Province. Based on the solar irradiation resource available, the topography of the site, and the current significant restrictions placed on other natural resources such as water, the development of a solar facility is the preferred option from a technology perspective.

Limited technology options are available for solar energy facilities, and the use of those that are considered are usually differentiated by weather and temperature conditions that prevail in the area, so that optimality is obtained by the final site selection. PV technology is the preferred option for implementation on the site in comparison to CSP as it is associated with limited water demand requirements and a lower visual profile.

Based on available information, it is concluded by the developer that the project site is considered best suited for the development of a solar PV facility from a technical perspective. Therefore, no technology alternatives are considered within this Scoping Report.

When considering **PV as a technology choice**, several types of panels are available, including *inter alia*:

- » Monofacial panels: PV panel modules that generate electricity from one (1) side of the module, whereas bifacial PV panel modules generate electricity from both the front and rear side of the module. Monofacial CSPV cells have a metalized back layer, bifacial cells allow light through to the back side of the CSPV cell. When bifacial cells are assembled into CSPV modules, the modules' transparent back sheet or rear glass layer allows sunlight to reflect onto the rear of the CSPV cells. This results in additional electricity generation. Monofacial modules typically have a nontransparent back sheet, and only absorb light on one side of the modules. For additional information describing bifacial product technology
- » Bifacial panels: As the name suggests, bifacial solar panels have two faces, or rather, they can absorb light from both sides of the panel. A lot of potential energy transfer is lost in traditional solar cells when the light hits the back of a solar panel. Most bifacial solar panels use monocrystalline cells, whereas traditional cells use polycrystalline materials. The monocrystalline materials, alongside the clear light pathway on both sides of the panel, enable the light to be absorbed from either side of

the cell, and it is thought that, that the overall efficiency of these cells can be up to 30% greater in commercial applications. Although, the exact amount is variable depending on the surface that they are installed on. The front side of the solar panel still absorbs most of the solar light, but the back side of the solar panel can absorb between 5-90% of the light absorbed by the front of the solar panel. Traditional solar panels use an opaque back sheet. By comparison, bifacial solar panels either have a clear/reflective back sheet or have dual panes of glass. Most of these solar panels are frameless so any issues with potential-induced degradation (PID) are reduced. To efficiently convert light into electricity from both sides, bifacial solar cells have selective-area metallization schemes that enable light to pass between the metallized areas, rather than the conventional thick metal collectors as seen with Monofacial solar panels. The technology that (at this stage) proves to be most feasible and reasonable with respect to the proposed solar facility is crystalline silicon panels, due to it being nonreflective, more efficient, and with a higher durability.

The primary difference between PV technologies available relate to the extent of the facility, as well as the height of the facility (visual impacts), while the potential for environmental impacts remains similar in magnitude. Fixed mounted PV systems can occupy a smaller extent and have a lower height when compared to tracking PV systems, which require both a larger extent of land, and are taller in height. However, both options are acceptable for implementation from an environmental perspective.

The PV panels are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance. The impacts associated with the construction, operation, and decommissioning of the facility are anticipated to be the same irrespective of the PV panel selected for implementation. Once environmental constraining factors have been determined through the Scoping and EIA process, MARIKANA Solar PV (Pty) Ltd will consider various solar panel options. The preferred option will be informed by efficiency as well as environmental impact and constraints (such as sensitive biophysical features). The PV panels proposed, will comprise solar panels which once installed, will stand less than 5m above ground level. The solar panels will include centralised inverter stations, or string inverters mounted above ground.

The following alternatives may be considered for the **overhead power line**:

- » Single Circuit Overhead Power Line - The use of single circuit overhead power lines to distribute electricity is considered the most appropriate technology and has been designed over many years for the existing 72 environmental conditions and terrain as specified in the Eskom Specifications and best international practice. Based on all current technologies available, single circuit overhead power lines are considered the most environmentally practicable technology available for the distribution of power.
- » Double Circuit Overhead Power Line - Where sensitive environmental features are identified, and there is sufficient justification, Eskom will consider the use of double circuit (placing 2 power lines on either side of the same tower structure) to minimise impacts.

It is proposed that a nominal up to 100 MWh **Battery Energy Storage Facility** for grid storage would be housed in stacked containers, with a maximum height of 8m and a maximum volume of 1,740m<sup>3</sup> of batteries and associated operational, safety and control infrastructure. Three types of battery technologies are being considered for the proposed project:

- » Lithium-ion,
- » Sodium-sulphur or
- » Vanadium Redox flow battery.

While there are various battery storage technologies available, the preferred alternative is the utility-scale Lithium-ion (Li-ion) battery energy storage. Li-ion batteries have emerged as the leading technology in utility-scale energy storage applications because it offers the best mix of performance specifications, such as high charge and discharge efficiency, low self-discharge, high energy density, and long cycle life (Divya KC et al., 2009). Battery storage offers a wide range of advantages to South Africa including renewable energy time shift, renewable capacity firming, electricity supply reliability and quality improvement, voltage regulation, electricity reserve capacity improvement, transmission congestion relief, load following and time of use energy cost management. In essence, this technology allows renewable energy to enter the base load and peak power generation market and therefore can compete directly with fossil fuel sources of power generation and offer a truly sustainable electricity supply option.

#### **4.3.4. The 'Do-Nothing' Alternative**

The 'do-nothing' alternative is the option of not establishing a new PV facility at the identified site in the Northern Cape Province. Should the option of not implementing the Solar PV facility be considered, the land use of the project site (livestock grazing) will continue, and there would not be environmental impacts as well as socio-economic benefits associated with the implementation of the project. The impact of not implementing the project (i.e., the "No-Go" alternative) will be assessed in the EIA phase of the process.

## CHAPTER 4 POLICY AND LEGISLATIVE CONTEXT

This Chapter provides an overview of the policy and legislative context within which the development of a solar PV facility, such as MARIKANA Solar PV facility, is proposed. It identifies environmental legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process which may be applicable to or have bearing on the proposed project.

### 4.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

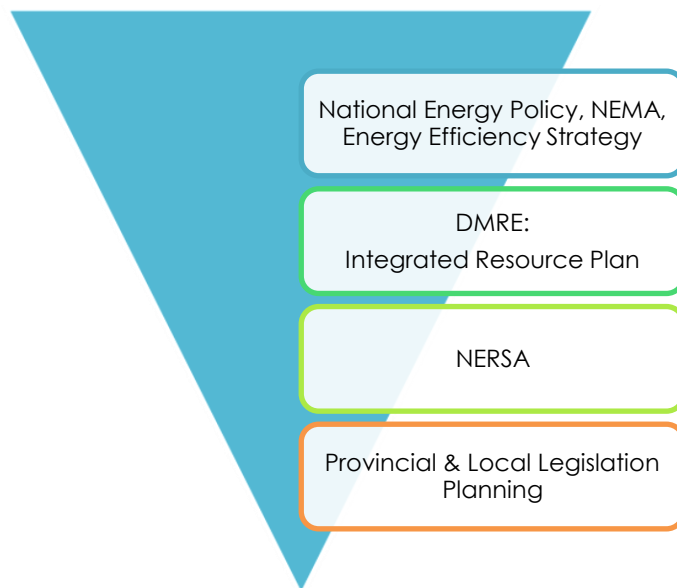
This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of Scoping Report:

Requirement	Relevant Section
(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	Chapter 4, as a whole, provides an overview of the policy and legislative context which is considered to be associated with the development of the solar energy facility. The regulatory and planning context has been considered at national, provincial, and local levels. A description of the policy and legislative context within which MARIKANA Solar PV facility is proposed is included in <b>sections 4.3, 4.4, 4.5 and 4.6.</b>
3(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.	The need and desirability of the MARIKANA Solar PV facility is included and discussed as a whole within this chapter. The need and desirability for the development of the facility has been considered from an international, national, regional, and site-specific perspective.

### 4.2. Strategic Electricity Planning in South Africa

The need to expand electricity generation capacity in South Africa is based on national policy and informed by on-going strategic planning undertaken by the Department of Mineral Resources and Energy (DMRE). The hierarchy of policy and planning documentation that support the development of renewable energy projects such as a solar energy facility is illustrated in **Figure 4.1**. These policies are discussed in more detail in the following sections, along with the provincial and local policies or plans that have relevance to the development of MARIKANA Solar PV facility. Even though the facility is proposed for the use by the mine, it is still important to demonstrate how this proposed project fits within this policy framework.

The South African energy industry is evolving rapidly, with regular changes to legislation and industry role-players. The regulatory hierarchy for an energy generation project of this nature consists of three tiers of authority who exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels. As solar energy developments are a multi-sectoral issue (encompassing economic, spatial, biophysical, and cultural dimensions) various statutory bodies are likely to be involved in the approval process of a solar energy project and the related statutory environmental assessment process.



**Figure 4.1: Hierarchy of electricity and planning documents**

At **National Level**, the main regulatory agencies are:

- » **Department of Mineral Resources and Energy (DMRE):** This Department is responsible for policy relating to all energy forms and for compiling and approving the Integrated Resource Plan (IRP) for electricity. Furthermore, the Department is also responsible for granting approvals for the use of land which is contrary to the objects of the Mineral and Petroleum Resource Development Act (Act No. 28 of 2002) (MPRDA) in terms of Section 53 of the Act. Therefore, in terms of the Act, approval from the Minister is required to ensure that proposed activities do not sterilise mineral resources that may occur within the project site and development area.
- » **National Energy Regulator of South Africa (NERSA):** NERSA is responsible for regulating all aspects of the electricity sector and will ultimately issue licenses for IPP projects to generate electricity.
- » **Department of Forestry, Fisheries, and the Environment (DFFE):** This Department is responsible for environmental policy and is the controlling authority in terms of NEMA and the EIA Regulations, 2014 (GN R326) as amended. The DFFE is also responsible for issuing permits for impacts on protected trees.
- » **The South African Heritage Resources Agency (SAHRA):** SAHRA is a statutory organisation established under the National Heritage Resources Act (No. 25 of 1999) (NHRA), as the national administrative body responsible for the protection of South Africa's cultural heritage.
- » **South African National Roads Agency Limited (SANRAL):** This Agency is responsible for the regulation and maintenance of all national road routes.
- » **Department of Water and Sanitation (DWS):** This Department is responsible for effective and efficient water resources management to ensure sustainable economic and social development. This Department is also responsible for evaluating and issuing licenses pertaining to water use (i.e., Water Use Licenses (WUL) and General Authorisation).
- » **The Department of Agriculture, Land Reform and Rural Development (DALRRD):** This Department is the custodian of South Africa's agricultural resources and is primarily responsible for the formulation and implementation of policies governing the agriculture sector. Furthermore, the Department is also responsible for issuing permits for the disturbance or destruction of protected tree species listed under Section 15 (1) of the National Forest Act (No. 84 of 1998) (NFA).

At **Provincial Level**, the main regulatory agencies are:

- » **North West Department of Economic Development, Environment, Conservation and Tourism (DEDECT)** is the Competent Authority for the project and is also responsible for issuing any biodiversity and conservation-related permits. The involvement relates specifically to sustainable resource management, conservation of protected species, and land care.
- » **North West Department of Public Works and Roads (NWDPR)** is responsible for roads and the granting of exemption permits for the conveyance of abnormal loads on public roads.
- » **North West Provincial Heritage Resources Agency (NWPHERA)** is responsible for the identification, conservation, and management of heritage resources, as well as commenting on heritage related issues within the province.
- » **North West Department of Community Safety and Transport Management (NWDCTM)** provides effective co-ordination of crime prevention initiatives, provincial police oversight, traffic management and road safety towards a more secure environment.

At the **Local Level**, the local and district municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. Both the local and district municipalities play a role. The local municipality includes the **Rustenburg Local Municipality** which forms part of the **Bojanala platinum District Municipality**. In terms of the Municipal Systems Act (No. 32 of 2000), it is compulsory for all municipalities to go through an Integrated Development Planning (IDP) process to prepare a five-year strategic development plan for the area under their control.

### 4.3. International Policy and Planning Context

A brief review of the most relevant international policies relevant to the establishment of the MARIKANA Solar PV facility are provided below in **Table 4.1**. The MARIKANA Solar PV facility is considered to be aligned with the aims of these policies, even if contributions to achieving the goals therein are only minor.

**Table 4.1:** International policies relevant to the MARIKANA Solar PV facility

Relevant policy	Relevance to the MARIKANA Solar PV facility
United Nations Framework Convention on Climate Change (UNFCCC) and Conference of the Party (COP)	<p>The Conference of the Parties (COP), established by Article 7 of the UNFCCC, is the supreme body and highest decision-making organ of the Convention. It reviews the implementation of the Convention and any related legal instruments and takes decisions to promote the effective implementation of the Convention.</p> <p>The Conference of the Parties (COP) 21 was held in Paris from 30 November to 12 December 2015. From this conference, an agreement to tackle global warming was reached between 195 countries.</p> <p>South Africa signed the Agreement in April 2016 and ratified the agreement on 01 November 2016. The Agreement was assented to by the National Council of Provinces on 27 October 2016, and the National Assembly on 1 November 2016.</p> <p>The Paris Agreement set out that every 5 years countries must set out increasingly ambitious climate action. This meant that, by 2020,</p>



Relevant policy	Relevance to the MARIKANA Solar PV facility
	<p>countries needed to submit or update their plans for reducing emissions, known as nationally determined contributions (NDCs). The COP26 summit held on 2021 brought parties together to accelerate action towards the goals of the Paris Agreement and the UN Framework Convention on Climate Change. On 13 November 2021, COP26 concluded in Glasgow with all countries agreeing the Glasgow Climate Pact to keep 1.5°C alive and finalise the outstanding elements of the Paris Agreement.</p> <p>South Africa's National Climate Change Response Policy (NCCRP) establishes South Africa's approach to addressing climate change, including adaptation and mitigation responses. The NCCRP formalises Government's vision for a transition to a low carbon economy, through the adoption of the 'Peak, Plateau and Decline' (PPD) GHG emissions trajectory whereby South Africa's emissions should peak between 2020 and 2025, plateau for approximately a decade, and then decline in absolute terms thereafter, and based on this the country has pledged to reduce emissions by 34% and 42% below Business as Usual (BAU) emissions in 2020 and 2025, respectively.</p> <p>The policy provides support for the MARIKANA Solar PV facility which will contribute to managing climate change impacts, supporting the emergency response capacity, as well as assist in reducing GHG emissions in a sustainable manner.</p>
<p>The Equator Principles IV (October 2020)</p>	<p>The Equator Principles (EPs) IV constitute a financial industry benchmark used for determining, assessing, and managing project's environmental and social risks. The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The EPs are applicable to large infrastructure projects (such as the MARIKANA Solar PV facility) and apply globally to all industry sectors.</p> <p>Such an assessment should propose measures to minimise, mitigate, and offset adverse impacts in a manner relevant and appropriate to the nature and scale of the MARIKANA Solar PV facility. In terms of the EPs, South Africa is a non-designated country, and as such the assessment process for projects located in South Africa evaluates compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability, and Environmental Health and Safety (EHS) Guidelines.</p> <p>The MARIKANA Solar PV facility is currently being assessed in accordance with the requirements of the 2014 EIA Regulations, as amended (GN R326), published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA), which is South Africa's national legislation providing for the authorisation of certain controlled activities. Through this assessment, all potential social and environmental risks are identified and assessed, and appropriate mitigation measures proposed.</p>

Relevant policy	Relevance to the MARIKANA Solar PV facility
<p>International Finance Corporation (IFC) Performance Standards and Environmental and Social Sustainability (January 2012)</p>	<p>The International Finance Corporation's (IFC) Performance Standards (PSs) on Environmental and Social Sustainability were developed by the IFC and were last updated on 1 January 2012.</p> <p>Performance Standard 1 requires that a process of environmental and social assessment be conducted, and an Environmental and Social Management System (ESMS) appropriate to the nature and scale of the project, and commensurate with the level of its environmental and social risks and impacts, be established and maintained. The above-mentioned standard is the overarching standard to which all the other standards relate. Performance Standards 2 through to 8 establish specific requirements to avoid, reduce, mitigate, or compensate for impacts on people and the environment, and to improve conditions where appropriate. While all relevant social and environmental risks and potential impacts should be considered as part of the assessment, the standards 2 and 8 describe potential social and environmental impacts that require particular attention specifically within emerging markets. Where social or environmental impacts are anticipated, the developer is required to manage them through its ESMS consistent with Performance Standard 1.</p> <p>Given the nature of the MARIKANA Solar PV facility, it is anticipated (at this stage of the process) that Performance Standards 1, 2, 3, 4, 6, and 8 may be applicable to the project.</p>
<p>International Just Energy Transition Partnership (2021)</p>	<p>The governments of South Africa, France, Germany, the United Kingdom, and the United States of America, along with the European Union, have announced a new ambitious, long-term Just Energy Transition Partnership to support South Africa's decarbonisation efforts. The Partnership aims to accelerate the decarbonisation of South Africa's economy, with a focus on the electricity system, to help it achieve the ambitious goals set out in its updated Nationally Determined Contribution emissions goals.</p>

#### 4.4. National Policy and Planning Context

The South African government has made a commitment in August 2011 to support the development of renewable energy capacity.

A brief review of the most relevant national policies is provided below in **Table 4.2**. The development of MARIKANA Solar PV facility is considered to align with the aims of these policies, even where contributions to achieving the goals therein are only minor.

**Table 4.2: Relevant national legislation and policies for MARIKANA Solar PV facility**

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
<p>Constitution of the Republic of South Africa, 1996</p>	<p>Section 24 of the Constitution pertains specifically to the environment. It states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution</p>

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
	<p>and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</p> <p>The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to environmental impacts. The undertaking of an EIA process for the proposed project in terms of the requirements of the EIA Regulations, 2014 (as amended) aims to minimise any impacts on the natural and social environment.</p>
<p>National Environmental Management Act (No. 107 of 1998) (NEMA)</p>	<p>This piece of legislation is South Africa's key piece of environmental legislation and sets the framework for environmental management in South Africa. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights.</p> <p>The national environmental management principles state that the social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed, and evaluated, and decisions must be appropriate in the light of such consideration and assessment.</p> <p>The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.</p>
<p>National Energy Act (No. 34 of 2008)</p>	<p>The purpose of the National Energy Act (No. 34 of 2008) is to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, while taking into account environmental management requirements and interactions amongst economic sectors, as well as matters relating to renewable energy. The National Energy Act also provides for energy planning, increased generation and consumption of renewable energies, contingency energy supply, holding of strategic energy feedstocks and carriers, adequate investment in, appropriate upkeep and access to energy infrastructure. The Act provides measures for the furnishing of certain data and information regarding energy demand, supply, and generation, and for establishing an institution to be responsible for promotion of efficient generation and consumption of energy and energy research.</p> <p>The Act provides the legal framework which supports the development of power generation facilities.</p>
<p>White Paper on the Energy Policy of the Republic of South Africa (1998)</p>	<p>The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa's energy security. This can be achieved through increased use of RE and encouraging new entries into the generation market.</p> <p>The policy states that the advantages of RE include, minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include higher capital costs in some cases, lower energy densities, and lower levels of availability, depending on specific conditions, especially with sun and wind-based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future.</p>

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
<p>White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)</p>	<p>The White Paper on Renewable Energy Policy Supplements Government's predominant policy on energy as set out in the White Paper on the Energy Policy of the Republic of South Africa (DME, 1998). The policy recognises the potential of RE and aims to create the necessary conditions for the development and commercial implementation of RE technologies.</p> <p>The White Paper on RE sets out Government's vision, policy principles, strategic goals, and objectives for promoting and implementing RE in South Africa. The country relies heavily on coal to meet its energy needs due to its abundant, and accessible and affordable coal resources. However, massive RE resources that can be sustainable alternatives to fossil fuels, have so far remained largely untapped.</p> <p>The development of additional renewable energy projects will promote the use of the abundant South African renewable energy resources and contribute to long-term energy security and diversification of the energy mix.</p>
<p>The Electricity Regulation Act (No. of 2006)</p>	<p>The Electricity Regulation Act of 2006, replaced the Electricity Act (No. 41 of 1987), as amended, except for Section 5B, which provides funds for the energy regulator for the purpose of regulating the electricity industry. The Act establishes a national regulatory framework for the electricity supply industry and introduces the National Energy Regulator (NERSA) as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licences and registration as the manner in which the generation, transmission, distribution, trading, and import and export of electricity are regulated. Schedule 2 of the Electricity Regulation Act provides for exemptions from the obligation in the Act to apply for (and hold) a licence from National Energy Regulator (NERSA). In terms of this schedule, the threshold for distributed generation was raised to 100MW in August 2021. Project developers are exempted from applying for a license but are required to register with NERSA and comply with the relevant grid code(s).</p>
<p>National Development Plan 2030</p>	<p>The National Development Plan (NDP) 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030.</p> <p>In terms of the Energy Sector's role in empowering South Africa, the NDP envisages that, by 2030, South Africa will have an energy sector that promotes:</p> <ul style="list-style-type: none"> <li>» Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.</li> <li>» Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.</li> <li>» Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.</li> </ul> <p>In formulating its vision for the energy sector, the NDP took the IRP 2010 as its point of departure. Therefore, although electricity generation from coal is still seen as part of the energy mix within the NDP, the plan sets out steps that aim to ensure that, by 2030, South Africa's energy system will look very different to the current situation: coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources – especially wind, solar, and imported hydroelectricity – will play a much larger role.</p>

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
	<p>The NDP aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The development of MARIKANA Solar PV Facility supports the NDP through the development of energy-generating infrastructure which will not lead to the generation of GHGs and will result in economic development and growth of the area surrounding the development area.</p>
<p>Integrated Energy Plan (IEP), 2016</p>	<p>The purpose and objectives of the Integrated Energy Plan (IEP) are derived from the National Energy Act (No. 34 of 2008). The IEP takes into consideration the crucial role that energy plays in the entire economy of the country and is informed by the output of analyses founded on a solid fact base. It is a multi-faceted, long-term energy framework which has multiple aims, some of which include:</p> <ul style="list-style-type: none"> <li>» To guide the development of energy policies and, where relevant, set the framework for regulations in the energy sector.</li> <li>» To guide the selection of appropriate technologies to meet energy demand (i.e., the types and sizes of new power plants and refineries to be built and the prices that should be charged for fuels).</li> <li>» To guide investment in and the development of energy infrastructure in South Africa.</li> <li>» To propose alternative energy strategies which are informed by testing the potential impacts of various factors such as proposed policies, introduction of new technologies, and effects of exogenous macro-economic factors.</li> </ul> <p>A draft version of the IEP was released for comment on 25 November 2016. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The development of the IEP is an ongoing continuous process. It is reviewed periodically to take into account changes in the macroeconomic environment, developments in new technologies and changes in national priorities and imperatives, amongst others.</p> <p>The 8 key objectives of the integrated energy planning process are as follows:</p> <ul style="list-style-type: none"> <li>» Objective 1: Ensure security of supply.</li> <li>» Objective 2: Minimise the cost of energy.</li> <li>» Objective 3: Promote the creation of jobs and localisation.</li> <li>» Objective 4: Minimise negative environmental impacts from the energy sector.</li> <li>» Objective 5: Promote the conservation of water.</li> <li>» Objective 6: Diversify supply sources and primary sources of energy.</li> <li>» Objective 7: Promote energy efficiency in the economy.</li> <li>» Objective 8: Increase access to modern energy.</li> </ul>
<p>Integrated Resource Plan for Electricity (IRP) 2010-2030</p>	<p>The Integrated Resource Plan (IRP) for electricity 2010 – 2030 is a subset of the IEP and constitutes South Africa's National electricity plan. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing, and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation.</p> <p>The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government</p>

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
	<p>objectives such as affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation, and regional development.</p> <p>Following the promulgation of the IRP 2010–2030, implementation followed in line with Ministerial Determinations issued under Section 34 of the Electricity Regulation (Act No. 4) of 2006. The Ministerial Determinations give effect to planned infrastructure by facilitating the procurement of the required electricity capacity.</p> <p>According to the IPP Procurement Programme overview report (2021), as at 31 March 2021, a total of 6 422MW has been procured under the REIPPP Programme from 112 IPPs in seven bid rounds, with 5 078MW being currently operational and made available to the grid. IPPs have commissioned 1005MW from two (2) Open Cycle Gas Turbines (OCGT) peaking plants.</p> <p>Under the Eskom Build Programme, 1 332MW has been procured from the Ingula Pumped Storage Project, 1 588MW and 800MW from the Medupi and Kusile power stations and 100MW from the Sere Wind Farm.</p> <p>Provision has been made for the following new capacity by 2030:</p> <ul style="list-style-type: none"> <li>» 1 500MW of coal</li> <li>» 2 500MW of hydro</li> <li>» 6 000MW of solar PV</li> <li>» 14 400MW of wind</li> <li>» 1 860MW of nuclear</li> <li>» 2 088MW of storage</li> <li>» 3 000MW of gas/diesel</li> <li>» 4 000MW from other distributed generation, co-generation, biomass and landfill technologies</li> </ul> <p>Of relevance to the proposed project is the provision for distributed generation capacity for own use. Therefore, the development of the MARIKANA Solar PV facility is supported by the IRP 2019.</p>
<p>New Growth Path (NGP) Framework, 23 November 2010</p>	<p>The purpose of the New Growth Path (NGP) Framework is to provide effective strategies towards accelerated job-creation through the development of an equitable economy and sustained growth. The target of the NGP is to create 5 million jobs by 2020; with economic growth and employment creation as the key indicators identified in the NGP. The framework seeks to identify key structural changes in the economy that can improve performance in terms of labour absorption and the composition and rate of growth.</p> <p>To achieve this, government will seek to, amongst other things, identify key areas for large-scale employment creation, as a result of changes in conditions in South Africa and globally, and to develop a policy package to facilitate employment creation in these areas.</p>
<p>National Development Plan 2030 (2012)</p>	<p>The National Development Plan (NDP) 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030.</p> <p>In terms of the Energy Sectors role in empowering South Africa, the NDP envisages that, by 2030, South Africa will have an energy sector that promotes:</p>

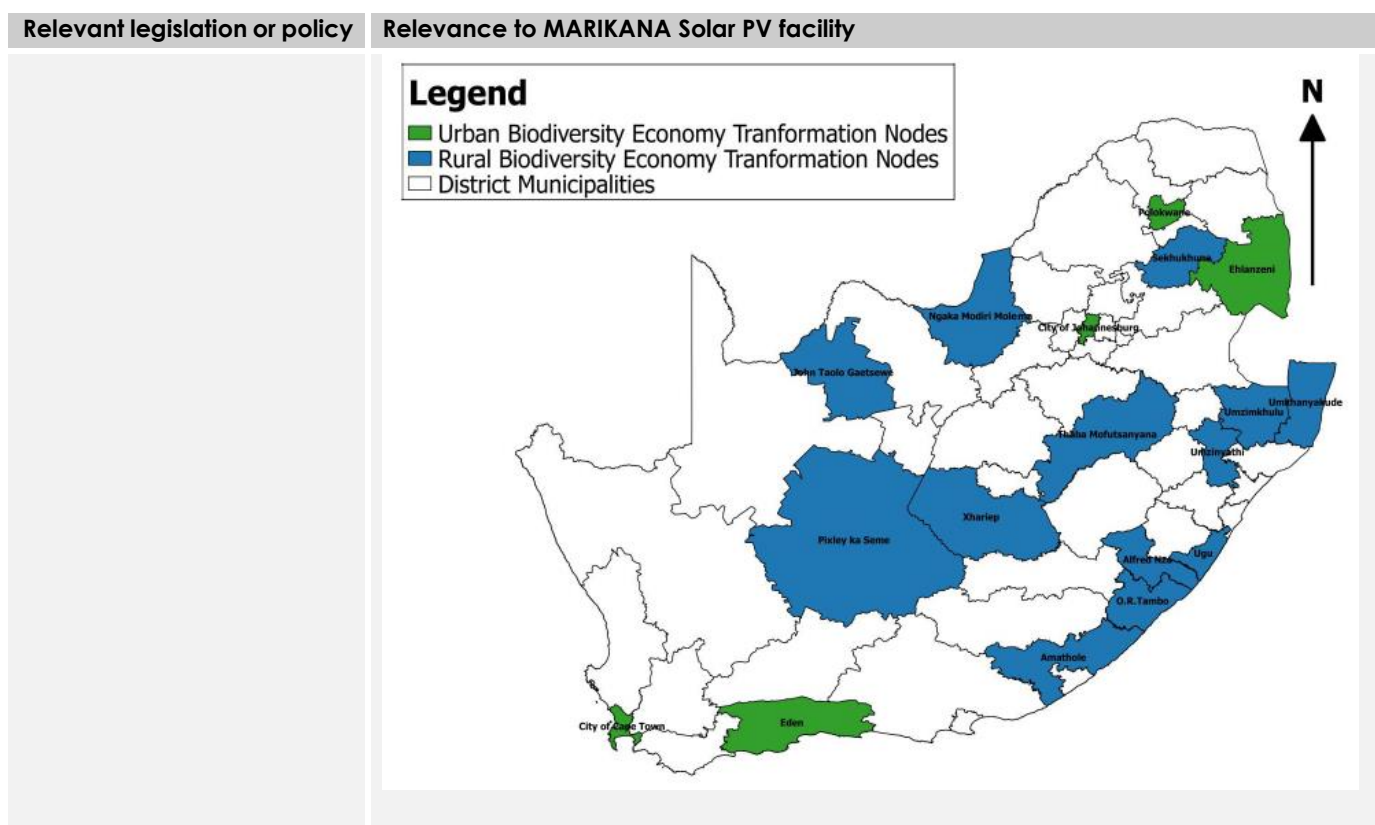
Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
	<ul style="list-style-type: none"> <li>» Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.</li> <li>» Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.</li> <li>» Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.</li> </ul> <p>In formulating its vision for the energy sector, the NDP took the IRP 2010 as its point of departure. Therefore, although electricity generation from coal is still seen as part of the energy mix within the NDP, the plan sets out steps that aim to ensure that, by 2030, South Africa's energy system will look very different to the current situation: coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources – especially wind, solar, and imported hydroelectricity – will play a much larger role.</p> <p>The NDP aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The development of MARIKANA Solar PV facility supports the NDP through the development of energy-generating infrastructure which will not lead to the generation of GHGs and will result in economic development and growth of the area surrounding the development area.</p>
<p>National Climate Change Response Policy, 2011</p>	<p>The Conference of the Parties (COP) 21 was held in Paris from 30 November to 12 December 2015. From this conference, an agreement to tackle global warming was reached between 195 countries. This Agreement is open for signature and subject to ratification, acceptance or approval by States and regional economic integration organisations that are Parties to the Convention from 22 April 2016 to 21 April 2017. Thereafter, this Agreement shall be open for accession from the day following the date on which it is closed for signature. The agreement can only be sanctioned once it has been ratified by 55 countries, representing at least 55% of emissions.</p> <p>South Africa signed the Agreement in April 2016 and ratified the agreement on 01 November 2016. The Agreement was assented to by the National Council of Provinces on 27 October 2016, and the National Assembly on 1 November 2016. The Agreement was promulgated on 04 November 2016, thirty days after the date on which at least 55 Parties to the Convention, which account for at least 55% of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval, or accession with the Depositary.</p> <p>South Africa's National Climate Change Response Policy (NCCRP) establishes South Africa's approach to addressing climate change, including adaptation and mitigation responses. The NCCRP formalises Government's vision for a transition to a low carbon economy, through the adoption of the 'Peak, Plateau and Decline' (PPD) GHG emissions trajectory whereby South Africa's emissions should peak between 2020 and 2025, plateau for approximately a decade, and then decline in absolute terms thereafter, and based on this the country has pledged to reduce emissions by 34% and 42% below Business as Usual (BAU) emissions in 2020 and 2025, respectively.</p> <p>The policy provides support for MARIKANA Solar PV facility, which will contribute to managing climate change impacts, supporting the emergency response capacity, as well as assist in reducing GHG emissions in a sustainable manner.</p>

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
Climate Change Bill, 2018	<p>On 08 June 2018, the Minister of Environmental Affairs published the Climate Change Bill ("the Bill") for public comment. The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans.</p> <p>MARIKANA Solar PV facility comprises a renewable energy generation facility and would not result in the generation or release of emissions during its operation.</p>
National Climate Change Response Strategy for South Africa, 2004	<p>The need for a national climate change policy for South Africa was identified as an urgent requirement during the preparations for the ratification of the UNFCCC in 1997. A process to develop such a policy was thus instituted under the auspices of the National Committee for Climate Change (NCCC), a non-statutory stakeholder body set up in 1994 to advise the Minister on climate change issues and chaired by the then Department of Environmental Affairs and Tourism (DEAT). It was determined that a national climate change response strategy will promote integration between the programmes of the various government departments involved to maximise the benefits to the country as a whole, while minimising negative impacts. Further, as climate change response actions can potentially act as a significant factor in boosting sustainable economic and social development, a national strategy specifically designed to bring this about is clearly in the national interest, supporting the major objectives of the government, including poverty alleviation and the creation of jobs.</p> <p>A number of principles and factors guided the conception of the strategy and are required to be implemented. These are:</p> <ul style="list-style-type: none"> <li>» Ensuring that the strategy is consistent with national priorities, including poverty alleviation, access to basic amenities including infrastructure development, job creation, rural development, foreign investment, human resource development and improved health, leading to sustainable economic growth.</li> <li>» Ensuring alignment with the need to consistently use locally available resources.</li> <li>» Ensuring compliance with international obligations.</li> <li>» Recognizing that climate change is a cross cutting issue that demands integration across the work programmes of other departments and stakeholders, and across many sectors of industry, business, and the community.</li> <li>» Focussing on those areas that promote sustainable development.</li> <li>» Promoting programmes that will build capacity, raise awareness, and improve education in climate change issues.</li> <li>» Encouraging programmes that will harness existing national technological competencies.</li> <li>» Reviewing the strategy constantly in the light of national priorities and international trends.</li> <li>» Recognizing that South Africa's emissions will continue to increase as development is realised.</li> </ul> <p>The strategy was devised through an integrated approach and considers policies and programmes of other government departments and the fact that South Africa is a developing country. This will ensure that the principles of sustainable development are adequately served and do not conflict with existing development policies.</p>



Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
Strategic Integrated Projects (SIPs)	<p>The Presidential Infrastructure Coordinating Commission (PICCC) is integrating and phasing investment plans across 18 Strategic Integrated Projects (SIPs) which have 5 core functions, including to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services, and support the integration of African economies.</p> <p>SIP 8 of the energy SIPs supports the development of RE projects as follows:  <i>Green energy in support of the South African economy: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010) and supports bio-fuel production facilities.</i></p> <p>The development of MARIKANA Solar PV facility is aligned with SIP 8 as it constitutes a green energy initiative that would contribute clean energy in accordance with the IRP 2010 – 2030.</p>
National Protected Area Expansion Strategy (2010)	<p>The National Protected Area Expansion Strategy 2010 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints, and opportunities (NPAES, 2010). According to the NPAES, there are no areas within the study area that have been identified as priority areas for inclusion in future protected areas. The study area is therefore outside the NPAES focus area.</p>
National Biodiversity Economy Strategy (NBES) (March 2016)	<p>The biodiversity economy of South Africa encompasses the businesses and economic activities that either directly depend on biodiversity for their core business or that contribute to conservation of biodiversity through their activities. The commercial wildlife and the bioprospecting industries of South Africa provide cornerstones for the biodiversity economy and are the focus of this strategy.</p> <p>Both the wildlife and bioprospecting sub-sectors of the biodiversity economy have already demonstrated the potential for significant future development and growth. In the study commissioned on the situational analysis of the biodiversity economy, the contribution of the biodiversity economy to the national economy can be measured in terms of Gross Domestic Product (GDP), with the wildlife and bioprospecting industries contributing approximately R3 billion to GDP in 2013. Growth in the wildlife and bioprospecting industries can make a significant impact on the national economy, while contributing to national imperatives such as job creation, rural development, and conservation of our natural resources.</p> <p>The Wildlife Industry value chain is centred on game and wildlife farming/ranching activities that relate to the stocking, trading, breeding, and hunting of game, and all the services and goods required to support this value chain. The key drivers of this value chain include domestic hunters, international hunters, and a growing retail market demand for wildlife products such as game meat and taxidermy products. This sector is therefore characterised by an interesting combination of agriculture, eco-tourism, and conservation characteristics.</p>

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
	<p>Over the period 2008-2013, the total Wildlife Industry market grew by more than 14% per year. This growth comprised an average annual growth exceeding 6% in domestic hunting, a decrease in international hunting, and an exponential growth in live auction sales. It is considered likely that the consolidated Wildlife Industry has the potential to experience a weighted average annual growth rate of between 4 %-14 % per year up to 2030.</p> <p>In order for the wildlife and bioprospecting sub-sectors of the biodiversity economy to achieve its full potential, a strategic partnership between the state, private sector and communities is required. To this end, a National Biodiversity Economy Strategy (NBES) is required to guide the sustainable growth of the wildlife and bioprospecting industries and to provide a basis for addressing constraints to growth, ensuring sustainability, identifying clear stakeholder's responsibilities, and monitoring progress of the Enabling Actions.</p> <p>The Vision of NBES is to optimise the total economic benefits of the wildlife and bioprospecting industries through its sustainable use, in line with the Vision of the Department of Environmental Affairs. The purpose of NBES is to provide a 14-year national coordination, leadership and guidance to the development and growth of the biodiversity economy.</p> <p>NBES has set an industry growth goal stating that by 2030, the South African biodiversity economy will achieve an average annualised GDP growth rate of 10% per annum. This envisioned growth curve extends into the year 2030 and is aligned to the efforts of the country's National Development Plan, Vision 2030. The NBES seeks to contribute to the transformation of the biodiversity economy in South Africa through inclusive economic opportunities, reflected by a sector which is equitable - equitable access to resources, equitable and fair processes, and procedures and equitable in distribution of resources (i.e., business, human, financial, indigenous species, land, water) in the market.</p> <p>To address these transformation NBES imperatives, NBES has the principles of:</p> <ul style="list-style-type: none"><li>» Conservation of biodiversity and ecological infrastructure</li><li>» Sustainable use of indigenous resources</li><li>» Fair and equitable beneficiation</li><li>» Socio-economic sustainability</li><li>» Incentive driven compliance to regulation</li><li>» Ethical practices</li><li>» Improving quality and standards of products.</li></ul> <p>The NBES provides the opportunity to redistribute South Africa's indigenous biological/genetic resources in an equitable manner, across various income categories and settlement areas of the country. The NBES has prioritised nodes in the country for biodiversity economy transformation, referred to as BET nodes. NBES prioritises 18 BET nodes, 13 rural and 5 urban districts across the nine provinces of the country, with communities having been prioritised for development of small and medium size enterprises and community-based initiatives which sustainably use of indigenous biological and/or genetic resources. The municipality within which the project is proposed is not identified as a priority area.</p>



#### 4.5. Provincial Planning and Context

A brief review of the most relevant provincial policies is provided below in **Table 4.2**. The proposed development is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

**Table 4.3: Relevant provincial legislation and policies for MARIKANA Solar PV facility**

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
North West Provincial Development Plan (PDP), 2013 (updated 2017/2022)	<p>The North West Provincial Development Plan (PDP) 2013 (updated 2017/2022) states that the overarching objective, is to overcome certain obstacles relating to the current infrastructure by introducing renewable energy together with energy conservation and efficiency strategies. Furthermore, this will craft a better tomorrow and ensure that underdevelopment, poverty, and inequality is fully addressed in the North West Province.</p> <p>The overall energy objective for the province also includes promoting the development of renewable energy supply schemes which are considered to be strategically important for increasing the diversity of domestic energy supply and avoiding energy imports, while also minimising the detrimental environmental impacts. The implementation of sustainable renewable energy is also to be promoted within the province through appropriate financial and fiscal instruments.</p>
North West Province Spatial Development Framework (SDF) (2016) – Published 2017	<p>The Spatial Development Framework (SDF) addresses the need for spatial planning, socio-economic development, infrastructure, and conservation of natural resources. Key socio-economic issues which would require strategic planning provision include employment (including youth and women); poverty eradication; attracting investment; economic growth; HIV / AIDS and other diseases; food security; physical infrastructure (including availability of industrial land); illiteracy; tourism development;</p>

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
	<p>population growth, urbanization, and migration. Natural resource issues include inadequate water resources for future development; bush encroachment and alien invasive species; land and soil degradation; and overgrazing. With regard to spatial planning, the legacies of Apartheid-era policy are identified as a key issue and residents of the North West are consequently extremely underdeveloped.</p> <p>As per the North West Provincial Spatial Development Framework (PSDF) (2017) electricity within the province is primarily provided by Eskom to re-distributors – mainly municipalities (10%), commercial (5%), agriculture (5%), mining (30%), industrial (30%) and Residential (20%).</p> <p>According to the North West PSDF the proposed project site is located within the Mahikeng Distribution Area, which is characterised by minor developments, including Commercial, Industrial, and Major Electrification; and has a projected growth of 125MW (Eskom, 2015).</p> <p>Eskom's Transmission Development Plan 2015 – 2024 represents the transmission network infrastructure investment requirements over the 10-year period between 2015 and 2024. Projects proposed for the North West Province for the next 10 years include the introduction of 400kV power lines and transformation to support or relieve the existing networks. Five transmission power corridors have been identified as critical to providing a flexible and robust network that could respond to meet the needs of future IPPs and IRP requirements.</p> <p>The development of the proposed PV facility and its associated grid connection infrastructure will contribute to economic growth and development, which will in turn help eradicate poverty through job creation and skills development in the region which will be in line with the North West SDF.</p>
<p>Bojanala Platinum District Municipality Climate Change Response Plan (2016)</p>	<p>Bojanala Platinum District Municipality acknowledged that climate change poses a threat to the environment, its residents, and future development. Actions are required to reduce carbon emissions (mitigation) and prepare for the changes that are projected to take place (adaptation) in the district. Bojanala Platinum District Municipality has therefore prioritised the development of a Climate Change Vulnerability Assessment and Climate Change Response Plan. The plan was developed through the Local Government Climate Change Support (LGCCS) program, with support from the Department of Environmental Affairs (DEA) and the Deutsche Gesellschaft für Internationale (GIZ).</p> <p>Through this program key climate change vulnerability indicators were identified. These are indicators where Bojanala Platinum District Municipality may be at risk to the impacts of climate change.</p>
<p>Renewable Energy Strategy for the North West Province (2012)</p>	<p>In 2012 the North West Province's then Department of Economic Development, Environment, Conservation and Tourism (DEDECT) developed the Renewable Energy Strategy for the North West Province. The strategy was developed in response to the need of the North West Province to participate meaningfully within South Africa's RE sector. The RE strategy aims to improve the North West Province's environment, reduce its contribution to climate change, and alleviate energy poverty, while promoting economic development and job creation whilst developing its green economy.</p> <p>According to the strategy in the North West Province consumes approximately 12% of South Africa's available electricity and is rated as the country's fourth largest</p>

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
	<p>electricity consuming province. This is mainly due to the high demand of the electrical energy-intensive mining and related industrial sector, with approximately 63% of the electricity supplied to the province being consumed in its mining sector.</p> <p>While the strategy recognises that South Africa has an abundance of RE resources available, it is cognisant of the fact that the applicability of these RE resources depend on a number of factors and as a result are not equally viable for the North West Province. The RE sources that were identified to hold the most potential and a competitive strength for the North West Province are Solar Energy (photovoltaic as well as solar water heaters), Municipal Solid Waste, hydrogen and fuel cell technologies, biomass, and energy efficiency.</p> <p>The advantages and benefits for the North West Province associated with the implementation and use of RE technologies include:</p> <ul style="list-style-type: none"> <li>» Provision of energy for rural communities, schools and clinics that are far from the national electricity grid.</li> <li>» Creation of an environment where access to electricity provides rural communities with the opportunity to create an economic base via agricultural and home-based industries and Small, Medium and Micro Enterprises (SMMEs) in order to grow their income-generating potential.</li> <li>» The supply of water within rural communities.</li> <li>» It would result in less time taken for the collection of wood and water, thus improving the quality of life within communities and specifically for women.</li> <li>» Improved health through the reduced use of fuelwood as energy source for cooking and heating that causes respiratory and other hazards.</li> <li>» Solar water heating for households in urban and rural settings, reducing the need for either electricity (in urban settings) and fuelwood (in rural settings) to heat water, thus lowering our National peak demand and conservation of woodlands in a sustainable manner.</li> <li>» Large-scale utilisation of renewable energy will also reduce the emissions of carbon dioxide, thus contributing to an improved environment.</li> <li>» The fact that RE go hand-in-hand with energy efficiency, it will result in additional financial benefit and the need for smaller RE systems.</li> <li>» The development of a strong localised RE industry within the NWP holds substantial potential for Black Economic Empowerment (BEE) and job creation within the province.</li> <li>» The establishment of a strong RE base in the North West Province, especially in the manufacturing of fuel cells could stimulate the market for Platinum Group Metals (PGM), which would in turn help the local mining sector.</li> </ul> <p>This is due to RE sources having considerable potential for increasing security of supply by diversifying the energy supply portfolio and increasingly contributes towards a long-term sustainable energy future. In terms of environmental impacts, RE results in the emission of less GHGs than fossil fuels, as well as fewer airborne particulates, and other pollutants. Furthermore, RE generation technologies save on water consumption in comparison with coal-fired power plants.</p>
<p>North West Environmental Implementation plan</p>	<p>The EIP describes Departmental policies, plans, and programmes that may impact on the environment and how these will comply with NEMA principles and national environmental norms and standards with the aim of ensuring that government integrates environmental considerations into its core mandate, functions, and</p>

Relevant legislation or policy	Relevance to MARIKANA Solar PV facility
	<p>activities. Many of the activities undertaken by government departments, at the national, provincial, district and local level, have impacts on the environment. The EIP aims to co-ordinate and harmonize the environmental policies, plans, programmes and decisions of the various departments that exercise functions that may affect the environment or are entrusted with powers and duties aimed at the achievement, promotion, and protection of a sustainable environment and of provincial and local spheres of government, in order to minimize the duplication of procedures and functions; and to promote consistency in the exercise of functions that may affect the environment. The province has championed and been in the forefront at national landscape with regard to promoting integrated planning and co-operative governance. Implementation of this plan will also help government to realize the objectives of the "Setsokotsane" which is an all-inclusive radical interventionist program by the Premier of North West, working together with all MEC's and people in the province to respond to the triple challenges of poverty, unemployment, and inequality. The "Scam werk, saam trek" philosophy also creates a platform for harmonization of the provincial policies, plans and programs. The plan will be implemented in the next five years and in terms of section 16(1)(b) of NEMA (as amended), every organ of state must report annually within four months of the end of the financial year on the implementation of its adopted EIP to the Director-General of Environmental Affairs.</p>

#### 4.6 Local Policy and Planning Context

The local tiers of government relevant to the MARIKANA Solar PV facility project are the Thabazimbi Local Municipality and the Waterberg District Municipality. Instruments and/or policies at both the district and local level contain objectives which align with the development of MARIKANA Solar PV facility. These include, economic growth, job creation, community upliftment and poverty alleviation.

**Table 4.4: Relevant district and local legislation and policies for MARIKANA Solar PV facility**

Relevant policy	Relevance to MARIKANA Solar PV facility
<p>Integrated Development Plan (IDP) of the Waterberg District Municipality 2020-2021</p>	<p>The Waterberg Municipality seeks to be the best energy hub and ecotourism destination in Southern Africa. The key economic sectors with the Waterberg District Municipality are mining, electricity/water, services, trade/catering, and agriculture, with mining making the biggest contribution to the GDP. The land use pattern is fairly natural within the district, with most of the mining operations concentrated on the periphery, whereas the central area is mostly characterised by the tourism and game industry.</p> <p>Waterberg District Municipality adopted a 2020/21 IDP Review Framework and Process Plan, which informed all 5 local municipality's process plans and it was adopted by the Municipal Council. The main purpose of the process plan is to integrate all the processes and activities, institutional arrangements and time frames of the various sector departments, NGOs, parastatal etc. The Framework/Process plan was adopted by Council in 2019. The process plan will guide the municipality in terms of Legislative requirements and the timeframes</p> <p>Process plans should:</p> <ul style="list-style-type: none"> <li>» Guide decision making in respect of service delivery and public sector investment</li> <li>» Inform budgets and service delivery programs of various government departments and service agencies</li> <li>» Coordinate the activities of various service delivery agencies within Waterberg District Municipality.</li> </ul>

Relevant policy	Relevance to MARIKANA Solar PV facility
Integrated Development Plan (IDP) of the Thabazimbi Local Municipality 2019/2020	The IDP states the following as priority development issues for the municipal area: <ul style="list-style-type: none"> <li>» Unemployment</li> <li>» Poverty alleviation</li> <li>» Services delivery</li> <li>» HIV/AIDS</li> <li>» Local Economic Development</li> <li>» Good governance</li> <li>» Institutional Development</li> <li>» Skills Development</li> <li>» Financial Viability</li> </ul> Municipal has Local Economic Development project such as: <ul style="list-style-type: none"> <li>» Support to small-scale mining</li> <li>» Poultry projects</li> <li>» Development of market stalls for informal traders at Northam and Thabazimbi</li> <li>» Establishment of a database of local SMMEs</li> </ul>

#### 4.7 Need and Desirability of the Proposed Development

Appendix 2 of the 2014 EIA Regulations (GNR 326), as amended requires that a Scoping Report include a motivation for the need and desirability of the proposed development, including the need and desirability of the activity in the context of the preferred location. The need and desirability of the development needs to consider whether it is the right time and the right place for locating the type of land-use/activity being proposed. The need and desirability of a proposed development is, therefore, associated with the wise use of land, and should be able to respond to questions such as, but not limited to, what the most sustainable use of the land may be.

The uptake of renewable energy sources in the mining sector has been a slow-moving transition – which can largely be attributed to the cost involved in establishing a solar/wind power plant, the added costs associated with storing that energy, regulatory challenges, and a limited track record in the industry.

Pressure from government and investors to improve environmental footprints by reducing carbon emissions is now one of the top five agenda items in business development, and incorporating renewable energy is an easy way to achieve this. In August 2021 with the aim to bolster energy security, President Cyril Ramaphosa announced that the licence threshold for independent power producers would be lifted from 1 MW to 100 MW, opening the door for companies to build their own generation facilities without the need to obtain a generation license from the National Energy Regulator of South Africa (NERSA).

Reliable and cost-effective energy, sourced and generated through private or internal arrangements eliminates the possibility of unexpected power outages and unreliable grid power from government-owned entities such as Eskom. The additional energy supply helps reduce the burden on such entities and reduces the need for energy management alternatives such as Load shedding.

In terms of value creation through sustainability it is estimated that the Sibanye Stillwater PGM projects would result in the company having minimum capital outlay to access renewable energy at a 30% to 50% discount to grid power which would generate a significant net present value for these operations plus significant decarbonisation. It would also offset the liabilities of anticipated pending Scope 2 carbon taxes.

Sibanye-Stillwater's South African PGM operations account for 310 MW, or 39%, of the group's energy demand. Owing to the infrastructure and extensive conventional mining methods, electricity is the predominant form of energy and, as a result, 97% of the emissions associated with the mining operations.

It is anticipated that this emission profile will decline over time, in line with Sibanye-Stillwater's PGM production profile, as well as when the renewable energy mix increases in the national electricity grid. However, a number of active decarbonisation measures are currently under way ahead of that amelioration. The PGM operations have advanced energy management practices, which last year resulted in 60 000 tonnes of greenhouse gas emissions being avoided, primarily through the deployment of digital twin simulations as well as the development of an energy culture.

Owing to the emissions profile, one of the strongest levers that the company can pull is the deployment of renewable energy, with three upcoming solar photovoltaic (PV) projects (Of which MARIKANA Solar PV forms part) and wind energy projects with allocated wheeling poised to enable rapid decarbonisation of these particular operations.

Scope 3 targets are also being set for those emissions that occur through the third-party processing of the company's concentrate, where electricity will continue to remain the focus of this operation owing to its emissions predominance. Given the company's expanded footprint in North West Province, it first undertook initial prefeasibility studies and then later a feasibility study into embedded solar PV power generation directly into the operations as an alternative energy source for the various mines.

In addition to the proposed solar projects, the mining giant is also procuring wind energy capacity from independent power producers. The company issued a request for information (RFI) earlier this year for off-site generation of up to 210MW of wind energy. Sibanye is hoping to be energy self-sufficient by 2038 and targets to be carbon neutral by 2040. The renewable energy plants will enable a 24% reduction in energy consumption for the Group by 2025 and also help the company to reduce its carbon emissions.

#### **5.7.1. Need for The MARIKANA Solar PV facility**

South Africa is a developing country with expanding energy demands and abundant coal supplies which is heavily relied upon to meet energy needs. The country acknowledges that carbon dioxide emissions from the usage of fossil fuels like coal and petroleum products have heightened worldwide concerns regarding climate change.

In South Africa, the problem of insufficient generation and supply is seen through the lens of global climate change, and the demand for increased investment in sustainable energy production is rapidly increasing. Renewable energy technologies may now compete with fossil-fuel technology because the government has created an enabling environment with an adequate legal and regulatory framework, and the technologies have become more economically feasible. As a result, the renewable energy industry will be able to function, grow, and contribute positively to the economy of South Africa and the global environment.

The National Development Plan 2030 formulated certain principles to guide "the transition to an environmentally sustainable low-carbon economy, moving from policy, to process, to action". The MARIKANA Solar PV Facility aims to meet these principles to accomplish Sibanye Stillwater's decarbonization



goals by capitalizing on the new 100MW embedded generation threshold and supplement the electricity required and purchased by the MARIKANA Platinum Mine from Eskom, through the self-generation of electricity from the solar energy resource. This opportunity leverages the potential cost savings of such supplementary supply, while taking advantage of the reduced carbon footprint of the renewable nature of the technology.

Additionally, the project would contribute towards meeting the national energy target as set by the Department of Energy (DoE) and assist the government in achieving its proposed renewable energy target of 17 800 MW by 2030. The proposed project would also have international significance as it contributes to South Africa being able to meet some of its international obligations by aligning domestic policy with internationally agreed strategies and standards as set by the United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, and United Nations Convention on Biological Diversity (UNCBD) all of which South Africa is a signatory to. Renewable energy is critical to South Africa as this source of energy is recognised as a major contribution to climate protection, has a much lower environmental impact, as well as advancing economic and social development.

The need and desirability from the perspective of the local community as reflected in the IDP and SDF for the area has been considered in this Scoping process. In the South African context, developmental needs (community needs) are often determined through the above planning measures (IDP and SDF). Although the renewable energy sector is not explicitly identified as a sector or initiative in all current municipal policy and planning documents as outlined above, it could contribute positively to the needs of the local community, including development, social services, education, and employment opportunities in this area through sustainable provision of energy to the MARIKANA Mine. The MARIKANA Solar PV facility will create employment and business opportunities during the construction and operation phases, as well as the opportunity for skills development for the local community. In addition, indirect benefits and spend in the local area will benefit the local community.

The DFFE (then, the Department of Environmental Affairs) Guideline on Need and Desirability (GN R891, 2014) notes that while addressing the growth of the national economy through the implementation of various national policies and strategies, it is also essential that these policies take cognisance of strategic concerns such as climate change, food security, as well as the sustainability in supply of natural resources and the status of our ecosystem services. The DFFE guideline further notes that at a project level (as part of an EIA process), the need and desirability of the project should take into consideration the content of regional and local plans, frameworks, and strategies. In light of the above, this section aims to provide an overview of the need and desirability for the proposed MARIKANA Solar PV Facility by highlighting how it is aligned with the strategic context of international, national, regional, and local development policy and planning, and broader societal needs as appropriate.

### **5.7.2. Receptiveness and desirability of the project site to develop The MARIKANA Solar PV facility**

The placement of a PV facility is strongly dependent on several factors including climatic conditions (solar resource), topography, the location of the site, land availability and suitability, the extent of the site and the need and desirability for the project. From a local level perspective, the project site and development area have specifically been identified by the proponent as being highly desirable from a technical perspective for the development of a PV facility due to the following site characteristics:

- » **Solar resource:** The economic viability of a solar PV facility is directly dependent on the annual direct solar irradiation values of the area within which it will operate. The Global Horizontal Irradiation (GHI) for the development area is approximately 2120 kWh/m<sup>2</sup>/annum in the North West Province. This is considered feasible for the development of a solar PV facility. Based on the solar resource available, no alternative locations are considered.
- » **Proximity to the MARIKANA Mine:** The development area is located in close proximity to the MARIKANA Platinum Mine, which will be the exclusive user of the generated power and is therefore preferred for development of the proposed PV Facility. Furthermore, there are existing available infrastructure that are considered as possibly forming part of the grid connection points in order to be able to evacuate the generated power from the PV facility to the MARIKANA Platinum Mine. The grid will tie-in behind the meter in the respective Sibanye customer substations. MARIKANA will be tying separately into the 88kV Wonderkop Substation via a new intake switchboard, a proposed routing of transmission lines to connect from PV site to tie-in point has been developed.
- » **Geographical and Topographical Consideration** – The topography in the wider area is characterised by a slope percentage between 0 and 10%, with some smaller patches within the project area characterised by a slope percentage in excess of 40%. This relatively uniform topography is feasible for the development of a PV facility such as that proposed.
- » **Land Availability and Suitability** – In order to develop The MARIKANA Solar PV facility and the associated grid connection with a contracted capacity of up to 30MW, sufficient space is required. The properties included in the project site were identified considering the feasible solar resource and are deemed technically feasible by the project developer for such development to take place. The project site is currently owned by the Sibanye Platinum PGM and Anglo Gold and has an extent of 100ha, which was considered by the developer as sufficient for the development of the Solar PV facility. An exact development footprint within the development area for the placement of infrastructure will be identified and assessed as part of the EIA Phase considering environmental constraints and sensitivities defined through the Scoping Study.

The broader project site is currently used for mining purposes and rural housing. The areas identified for the PV facility although on mining land will not impact on the mining activities. The development of the solar PV facility on this property will ensure the continuation of an economically viable land use and will support the long-term operation of the mine. Sites that facilitate easy construction conditions (i.e., relatively flat topography, lack of major rock outcrops etc.) are favoured during the site selection process for a solar PV facility, and the proposed development area fits this criterion.

- » **Proximity to Towns with a Need for Socio-Economic Upliftment:** The proposed project is located near the towns of Rustenburg, within the Rustenburg Local municipality falling under the Bojanala Platinum District Municipality. As per the Integrated Development Planning detailed in Section 4.6, these districts still experience high levels of unemployment, poverty, and inequality mainly amongst the youth, women, and people with disabilities. Main access to the project site is via 6 Ave Road which branches off the R24 provincial road. The site is therefore easily accessible for both construction and operation. With the development of The MARIKANA Solar PV facility, secondary social benefits can be expected in terms of additional spend in the nearby towns due to the increased demand for goods and services. Considering the above, it is clear that a need for employment opportunities and skills development is present within the area.

Taking into consideration the solar resource, proximity to the mine, land availability and suitability, geographical and topographical location, access to road infrastructure and proximity to towns with a need for socio-economic upliftment, the development of The MARIKANA Solar PV facility within the proposed project site is considered to be desirable.

### **5.7.3. Benefits of Renewable Energy and the Need and Desirability in the South African Context**

The generation of electricity from renewable energy resources offers a range of potential socio-economic and environmental benefits for South Africa. These benefits include:

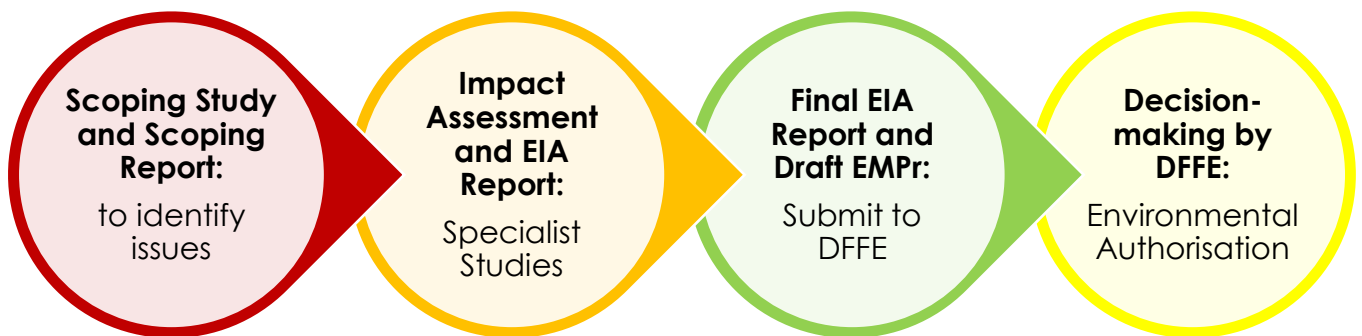
- » **Socio-economic upliftment of local communities:** The MARIKANA Solar PV facility has the potential to create much needed employment for unskilled locals during the construction phase. Where possible, training opportunities will also be afforded to qualified local people who can be upskilled to undertake certain roles during the construction and operation phases. Some of the challenges facing the Local and District municipalities, as detailed in the IDPs include high rates of unemployment and high levels of poverty. The Local and District municipalities are therefore in need of economic development, sustainable employment opportunities and growth in personal income levels. A study undertaken by the DMRE, National Treasury and the Development Bank of Southern Africa (DBSA) in June 2017 found that employment opportunities created during the construction phase of renewable energy projects implemented to date had created 40% more jobs for South African citizens than anticipated. The study also found that significantly more people from local communities were employed during construction than was initially planned, confirming the potential benefits for local communities associated with the implementation of renewable energy projects.
- » **Resource saving:** It is estimated that the achievement of the targets in the Renewable Energy White Paper will result in water savings of approximately 16.5 million kilolitres per annum. As an already water-stressed nation, it is critical that South Africa engages in a variety of water conservation measures, particularly due to the detrimental effects of climate change on water availability. Renewable energy also translates into revenue savings, as fuel for renewable energy facilities is free, while compared to the continual purchase of fuel for conventional power stations.
- » **Exploitation of significant renewable energy resource:** At present, valuable renewable resources, including biomass by-products, solar irradiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio in South Africa.
- » **Economics:** As a result of the excellent resource and competitive procurement processes, both wind power and solar PV power are now proven in South Africa as cheaper forms of energy generation than coal power. They offer excellent value for money to the economy and citizens of South Africa while benefitting society as a whole through the development of clean energy.
- » **Pollution reduction:** The release of by-products through the burning of fossil fuels for electricity generation has a particularly hazardous impact on human health and contributes to ecosystem degradation. The use of solar irradiation or wind for power generation is a non-consumptive use of a natural resource which produces zero emissions during its operation.

- » **Climate friendly development:** The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of GHG emissions. South Africa is estimated to currently be responsible for approximately 1% of global GHG emissions (and circa half of those for which Africa is responsible) and is currently ranked 9<sup>th</sup> worldwide in terms of per capita carbon dioxide emissions. The development of the MARIKANA Solar PV facility and the associated electricity generated as a result of the facility, will result in considerable savings on tons of CO<sub>2</sub> emissions.
- » **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 the Paris Agreement, and for cementing its status as a leading player within the international community.
- » **Employment creation:** The development, procurement, installation, maintenance, and management of renewable energy facilities have significant potential for job creation and skills development in South Africa. The construction phase will create temporary employment opportunities and the operation phase will create limited full-time employment opportunities.
- » **Acceptability to society:** Renewable energy offers a number of tangible benefits to society, including reduced pollution concerns, improved human and ecosystem health and climate friendly development.
- » **Support to a new industry sector:** The development of renewable energy offers the opportunity to establish a new industry within the South African economy, which will create jobs and skill local communities which have potential for further renewable energy projects.
- » **Protecting the natural foundations of life for future generations:** Actions to reduce our disproportionate carbon footprint can play an important part in ensuring our role in preventing dangerous anthropogenic climate change, thereby securing the natural foundations of life for generations to come; this is the basis of sustainable development.

## CHAPTER 5 CHAPTER 5 APPROACH TO UNDERTAKING THE SCOPING PHASE

In terms of the EIA Regulations of December 2014 (as amended) published in terms of the NEMA (Act No. 107 of 1998) as amended, the construction and operation of MARIKANA Solar PV Facility is a listed activity requiring Environmental Authorisation (EA). The application for EA is required to be supported by a Scoping & Environmental Impact Assessment (EIA) process based on the contracted capacity of the facility being 100MW and Activity 1 of Listing Notice 2 (GNR 325) being triggered.

An EIA process refers to the process undertaken in accordance with the requirements of the relevant EIA Regulations (the 2014 EIA Regulations (GNR 326), as amended), which involves the identification and assessment of direct, indirect, and cumulative environmental impacts associated with a proposed project or activity. The EIA process comprises two main phases: i.e., Scoping and EIA Phase, and is illustrated in Figure 5.1 Public Participation forms an important component of the process and is undertaken throughout both phases.



**Figure 5.1:** The Phases of an Environmental Impact Assessment (EIA) Process

### 5.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 2: Content of a Scoping report:

Requirement	Relevant Section
(d)(i) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for and (ii) a description of the activities to be undertaken, including associated structures and infrastructure.	All listed activities triggered and applied for are included in <b>Section 5.2</b> .
(g)(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	The public participation process followed throughout the EIA process of MARIKANA Solar PV Facility is included in <b>Section 5.5.2</b> and copies of the supporting documents and inputs are included in <b>Appendix C</b> .

Requirement	Relevant Section
(g)(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	The main issues raised through the undertaking of the public participation process including consultation with I&APs are included in the Comments and Responses Report in <b>Appendix C8</b> .
(g)(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives are included in <b>Section 5.5.3</b> .

## 5.2. Relevant legislative permitting requirements

The legislative permitting requirements applicable to MARIKANA Solar PV Facility, as identified at this stage in the process and considered within this EIA process, are described in more detail under the respective sub-headings. Additional permitting requirements applicable to the project are detailed within **Section 5.6**.

### 6.2.1. National Environmental Management Act (No. 107 of 1998) (NEMA)

NEMA (No. 107 of 1998) is South Africa's key piece of national environmental legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with listed activities must be considered, investigated, assessed, and reported on to the Competent Authority (the decision-maker) charged by NEMA with granting of the relevant Environmental Authorisation (EA).

The need to comply with the requirements of the EIA Regulations published under NEMA ensures that developers are provided the opportunity to consider the potential environmental impacts of their activities early in the project development process, and also allows for an assessment to be made as to whether environmental impacts can be avoided, minimised, or mitigated to acceptable levels. Comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations to provide the Competent Authority with sufficient information in order for an informed decision to be taken regarding the Application for EA.

The EIA process being conducted for MARIKANA Solar PV Facility is being undertaken in accordance with Section 24(5) of the NEMA, which defines the procedure to be followed in applying for EA, and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the competent authority. Listed Activities are activities identified in terms of Section 24 of the NEMA which are likely to have a detrimental effect on the environment, and which may not commence without an EA from the competent authority subject to the completion of an environmental assessment process (either a Basic Assessment (BA) or full Scoping and EIA).

**Table 5.1** details the listed activities in terms of the EIA Regulations, 2014 (as amended) that apply to the SBPM Solar PV, and for which an application for Environmental Authorisation has been submitted to the **DEDECT**. The table also includes a description of the specific project activities that relate to the applicable listed activities.

**Table 5.1:** Listed activities identified in terms of the Listing Notices (GNR 327, 325 and 324).

Notice Number	Activity Number	Description of listed activity
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	11 (i)	The development 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 275kV or more.  <b>Internal electrical infrastructure required to connect the PV facilities to the grid connection infrastructure will consist of an onsite substation and power lines of more than 33kV.</b>
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	12(ii)(a)(c)	The development of – (ii) Infrastructure or structures with a physical footprint of 100 square metres or more  Where such development occurs- a) within a watercourse or c) within 32 metres of a watercourse, measured from the edge of a watercourse  <b>The proposed development will require the establishment of infrastructures within a physical footprint exceeding 100 square metres within a watercourse or within 32 metres of a watercourse identified within the project area.</b>
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	14	The development and related operation of facilities and infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.  <b>The development of the project will require the construction and operation of facilities and infrastructure for the storage and handling of dangerous goods (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the on-site substation where such storage will occur inside containers with a combined capacity exceeding 80 cubic meters but not exceeding 500 cubic meters.</b>
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	19 (ii)	The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles, or rock of more than 10 cubic meters from a (i)watercourse.  <b>Some parts of the development area are located within watercourses and will require the removal of approximately 10 cubic metres of soil and rock from the watercourses during the construction phase.</b>
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	24 (ii)	The development of a road—  (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.  <b>Access roads will be developed during the construction phase of the project. These will exceed 8m in width.</b>
Listing Notice 1 (GNR 327)	28 (ii)	Residential, mixed, retail, commercial, industrial, or institutional developments where such land was used for agriculture, game

08 December 2014 (as amended)		<p>farming, equestrian purposes, or afforestation on or after 01 April 1998 and where such development:</p> <p>(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.</p> <p><b>The total area to be developed for the MARIKANA Solar facility is great than 1ha and occurs outside an urban area in an area currently zoned for agriculture.</b></p>
Listing Notice 2 (GNR 325) 08 December 2014 (as amended)	1	<p>The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more,</p> <p><b>The project comprises a renewable energy generation facility, which will utilise solar power technology and will have a generating capacity of up to 100MW.</b></p>
Listing Notice 2 (GNR 325) 08 December 2014 (as amended)	15	<p>The clearance of an area of 20ha or more of indigenous vegetation<sup>3</sup>.</p> <p><b>The project would result in the clearance of indigenous vegetation within an area in excess of 20ha for the development infrastructure.</b></p>
Listing Notice 3 (GNR 324) 08 December 2014 (as amended)	4(h)(iv)	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>h. North West</p> <p>iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p><b>Some parts of the development area are located within a CBA and will require the construction of a new access roads wider than 4m during the construction phase.</b></p>
Listing Notice 3 (GNR 324) 08 December 2014 (as amended)	10(h)(iv)	<p>The development and related operation 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</p> <p>h. North West</p> <p>(iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.</p> <p><b>The development of the PV facility and associated infrastructures will require the storage and handling of dangerous goods with a capacity of up to 80 cubic meters within CBA areas.</b></p>
Listing Notice 3 (GNR 324) 08 December 2014 (as amended)	12(h)(iv)	<p>The clearance of an area of 300 square metres or more of indigenous vegetation</p> <p>h. North West</p>

<sup>3</sup> "Indigenous vegetation" as defined by the 2014 EIA Regulations (GNR 326) refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.



		<p>iv. Within critical biodiversity areas identified in bioregional plans</p> <p><b>The development of the MARIKANA Solar PV Facility will require the clearance of more than 300 square meters of indigenous vegetation within areas classified as CBA.</b></p>
<p>Listing Notice 3 (GNR 324) 08 December 2014 (as amended)</p>	<p>14(ii)(a)(c)(h)(ii) ff)</p>	<p>The development of— (ii) infrastructure or structures with a physical footprint of 10 square meters or more.</p> <p>where such development occurs— (a) within a watercourse. (c) within 32 meters of a watercourse, measured from the edge of a watercourse.</p> <p>h. North West</p> <p>iv. Outside urban areas:</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</p> <p><b>Some parts of the development area are located within CBA1. The development of MARIKANA Solar PV Facility will require the development of infrastructure within 32m of a watercourse, outside urban areas and within areas classified as CBA.</b></p>
<p>Listing Notice 3 (GNR 324) 08 December 2014 (as amended)</p>	<p>18(h)(i)(v)</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>h. North West</p> <p>(v) Within critical biodiversity areas identified in systematic biodiversity plan adopted by the competent authority or in bioregional plans</p> <p><b>Some parts of the development area are located within CBA. The development of MARIKANA Solar PV Facility will require the development of infrastructure within 32m of a watercourse, outside urban areas and within areas classified as CBA.</b></p>

### 6.2.2. National Water Act (No. 36 of 1998) (NWA)

In accordance with the provisions of the National Water Act (No. 36 of 1998) (NWA), all water uses must be licensed with the Competent Authority (i.e., the Regional Department of Water and Sanitation (DWS) or the relevant Catchment Management Agency (CMA)). Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.

In terms of the NFEPA (2011) and the NBAs 2018 National Wetlands Map 5 no wetlands are located within the extent of the project area. However, areas classified as rivers are extensive throughout the project.

**Table 5.2** contains Water Uses associated with the proposed project and identified in terms of the NWA which require licensing either in the form of a General Authorisation (GA), or in the form of a Water Use License (WUL). The table also includes a description of those project activities which relate to the applicable Water Uses.

**Table 5.2:** List of Water Uses published under Section 21 of NWA, as amended.

Notice No.	Activity No.	Description of Water Use
NWA (No. 36 of 1998)	Section 21 (c)	Impeding or diverting the flow of water in a watercourse  The development area considered for the establishment of the MARIKANA Solar PV Facility has no wetlands located within the extent of the project area, however there are areas classified as rivers throughout the project development area, that might be affected by the activities pertaining to the establishment of the solar PV facility. This will be confirmed during the EIA phase.
NWA (No. 36 of 1998)	Section 21 (i)	Altering the bed, banks, course, or characteristics of a watercourse.  The development area considered for the establishment of the MARIKANA Solar PV Facility has no wetlands located within the extent of the project area, however there are areas classified as rivers throughout the project development area, that might be affected by the activities pertaining to the establishment of the solar PV facility. This will be confirmed during the EIA phase.

In the event that the flow of water in the watercourses is affected and the bed, banks or course characteristics are altered then a water use authorisation would be required. This will need to be in accordance with the requirements of the Regulations Regarding the Procedural Requirements for Water Use License Applications and Appeals (GN R267), or a GA registered in accordance with the requirements of Revision of General Authorisation. The process of applying for a WUL or GA registration will only be completed once a positive EA has been received. This is in line with the requirements of the Department of Water and Sanitation (DHSWS).

### 6.2.3. National Heritage Resources Act (No. 25 of 1999) (NHRA)

The National Heritage Resources Act (No. 25 of 1999) (NHRA) provides an integrated system which allows for the management of national heritage resources, and to empower civil society to conserve heritage resources for future generations. Section 38 of NHRA provides a list of activities which potentially require the undertaking of a Heritage Impact Assessment.

#### Section 38: Heritage Resources Management

- 1). Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –
  - a. the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length.

- b. the construction of a bridge or similar structure exceeding 50m in length.
- c. any development or other activity which will change the character of a site –
  - i). exceeding 5 000m<sup>2</sup> in extent; or
  - ii). involving three or more existing erven or subdivisions thereof; or
  - iii). involving three or more erven or divisions thereof which have been consolidated within the past five years; or
  - iv). the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resource authority.

Must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.

In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed development, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the South African Heritage Resources Agency (SAHRA) Permit Regulations (GNR 668).

### 5.3. Overview of the Scoping and EIA (S&EIA) Process being undertaken for MARIKANA Solar PV Facility

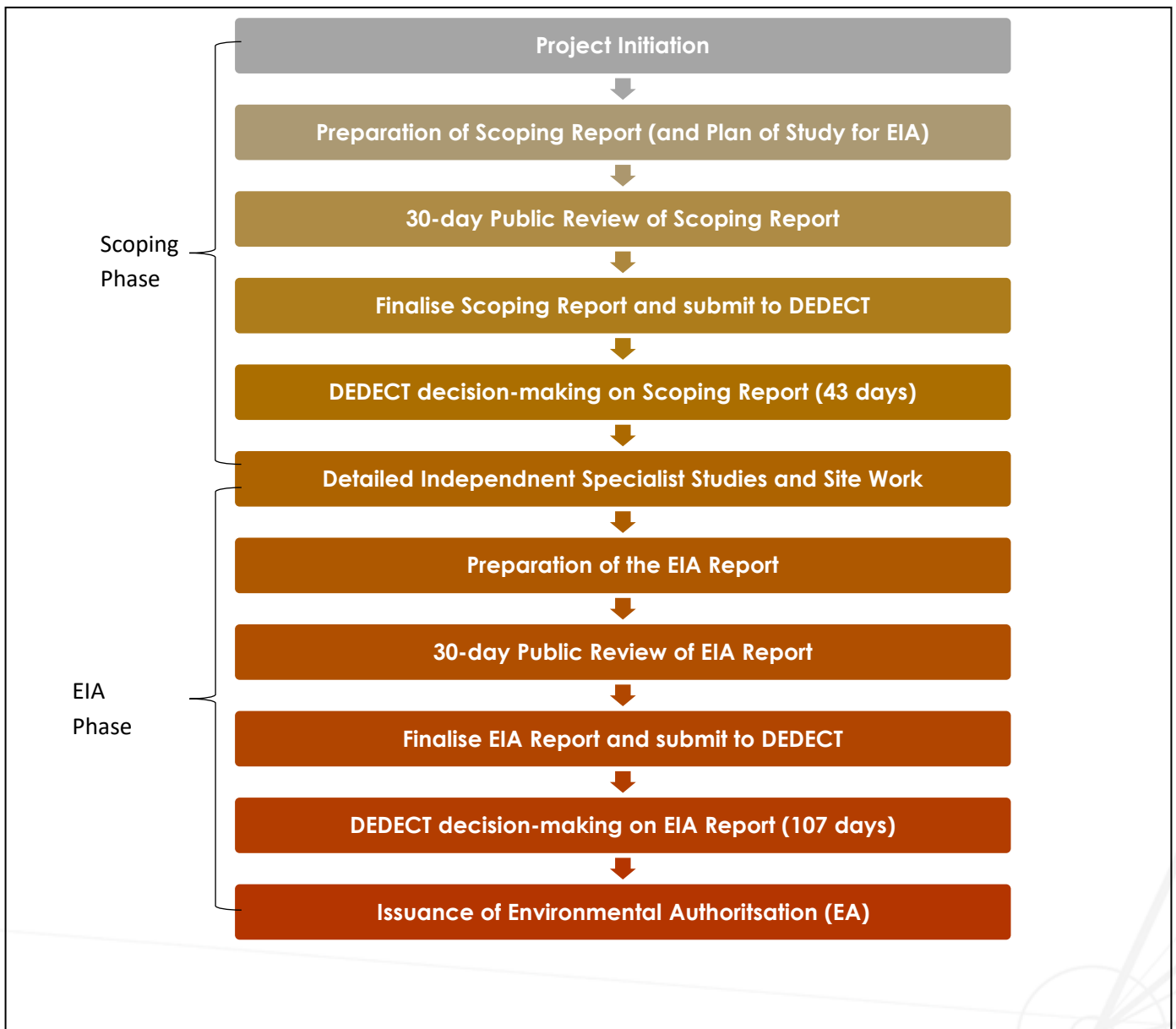
In terms of NEMA, the 2014 EIA Regulations (GNR 326), and Listing Notices (Listing Notice 1 (GNR 327) and Listing Notice 2 (GNR 325) the development of MARIKANA Solar PV Facility requires EA from DEDECT subject to the completion of a full Scoping and Environmental Impact Assessment (S&EIA), as prescribed in Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326). The need for a full S&EIA process to be conducted in support of the application for EA is based on listed activities triggered which are contained within Listing Notice 2 (GNR 325).

The S&EIA process is to be undertaken in two phases as follows (refer to **Figure 5.2**):

- » **The Scoping Phase** includes the identification and description of potential issues associated with the project through a desktop study and consultation with I&APs and key stakeholders through a Public Participation process. The entire development area and development envelope are considered within this process. Through this study, areas of sensitivity within the broader site are identified and delineated in order to identify any environmental fatal flaws, and environmentally sensitive, or no-go areas which need to be considered. In accordance with Regulation 21(1) of the 2014 EIA Regulations (GNR 326) this Scoping Report prepared for the project will be subject to a 30-day review and comment period during which any Interested and Affected Party (I&AP) or Authority are invited to review and provide comment on the findings. Following the completion of this review period, a Final Scoping Report which incorporates all comments received during the 30-day public review and comment period, will be prepared, and submitted to DEDECT For its consideration. Following its receipt of the Final Scoping Report DEDECT as 43 days within which to either accept the Scoping Report, and advise the applicant to proceed or continue with the tasks contemplated in the Plan of Study for EIA, or refuse the Application for EA in the event that the proposed activity is in conflict with

a prohibition contained in legislation, or the Scoping Report does not substantially comply with Appendix 2 of the 2014 EIA Regulations (GNR 326).

- » **The EIA Phase** involves a detailed assessment of potentially significant positive and negative direct, indirect, and cumulative impacts identified during the Scoping Phase. This phase includes detailed specialist investigations and a Public Participation process, and results in the compilation of an EIA Report and Environmental Management Programme (EMPr). In accordance with Regulation 23(1)(a) of the 2014 EIA Regulations (GNR 326) the EIA Report and EMPr prepared for the project will also be subject to a 30-day public review and comment period during which members of the public, I&APs, and authorities will be invited to review and provide comment on the EIA Report and EMPr. Following the conclusion of this review period a Final EIA Report and EMPr which incorporates all comments received during the 30-day review and comments period, will be prepared, and submitted to DEDECT for its consideration. Following its receipt of the Final EIA Report and EMPr, DEDECT has 107 days within which to either grant or refuse the EA.



**Figure 5.2:** Regulated timeframe of an Environmental Impact Assessment (EIA) Process

#### **5.4. Objectives of the Scoping Phase**

This Scoping Report documents the evaluation of potential environmental impacts of MARIKANA Solar PV Facility and forms part of the EIA process being conducted in support of an Application for EA for the project. The Scoping Phase has been conducted in accordance with the requirements of the 2014 EIA Regulations (GNR 326), and therefore aims to:

Identify and evaluate potential environmental (biophysical and social) impacts and benefits of all phases of the proposed development (including design, construction, operation, and decommissioning) within the broader project site and development area through a review of existing baseline data, including specialist studies which were undertaken within the project area.

Identify potentially sensitive environmental features and areas within the broader project site and development area in order to inform the preliminary design process of the facility.

Define the scope of studies to be undertaken during the EIA process.

Provide the authorities with sufficient information in order to make a decision regarding the scope of issues to be addressed in the EIA Phase, as well as regarding the scope and extent of specialist studies that will be required to be undertaken.

The following objectives of the Scoping Phase (in accordance with Appendix 2 of the 2014 EIA Regulations (GNR 326)) have been met, through the undertaking of a consultative process.

The identification of relevant policies and legislation regarding the activities to be undertaken have been identified and considered within this Scoping Report.

Activities to be undertaken for the development of MARIKANA Solar PV Facility have been identified and motivated in terms of the need and desirability for the activities to take place.

Potential impacts associated with the undertaking of the identified activities and technology have been identified and described.

Identification of areas of high sensitivity to be avoided by the preferred development envelope.

Preferred areas for the development in the form of a development envelope, which are areas associated with low to medium environmental sensitivity, have been identified within the development area through a desktop level impact assessment process and on-going consultative process. Areas of high sensitivity (i.e., the north, north-western and southern portions of the development area) have been avoided by the development envelope which will be assessed within the EIA Phase, within which the development footprint will be placed.

Key issues associated with the project to be addressed during the EIA Phase for further detailed study and ground-truthing have been identified and listed within this Scoping Report.

The level of assessment, expertise, and the extent of further consultation to be undertaken in the EIA Phase of the process, with the aim of determining the extent of impacts associated with the activities through the life cycle of the project (i.e., construction, operation, and decommissioning), have been identified and included within this Scoping Report.

## 5.5. Overview of the Scoping Phase

Key tasks undertaken within the Scoping Phase include:

- » Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
- » Submission of the completed Application for EA to the competent authority (DEDECT) in terms of Regulations 5 and 16 of the 2014 EIA Regulations (GNR 326).
- » Undertaking a public participation process in accordance with Chapter 6 of GNR326, and the Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa (hereinafter referred to as "the Guidelines") in order to identify issues and concerns associated with the proposed project.
- » Undertaking of independent specialist studies in accordance with Appendix 6 of the EIA Regulations, 2014 (GNR326), as amended, and the requirements of the Specialist Protocols published in Regulation GNR 320, issued 20 March 2020 and GNR 1150 of 30 October 2020, where relevant, as well as other relevant guidelines.
- » Preparation of a Scoping Report and Plan of Study for EIA in accordance with the requirements of Appendix 2 of the 2014 EIA Regulations (GNR 326).
- » Preparation of a Comments and Response (C&R) Report detailing all comments raised by I&APs and responses provided as part of the Scoping Phase.
- » Submission of a Final Scoping Report, including a Plan of Study for the EIA, to DEDECT for review and approval.

### 6.5.1. Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended)

As the proposed project is intended for self-generation of electricity from a renewable resource which will not be fed into the national grid, the North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT) is the competent authority for the project. Consultation with these authorities is being undertaken throughout the Scoping Phase. To date, this consultation has included the following:

- » Submission of a pre-application meeting request to the DEDECT was sent via email on 03 May 2022. Following the internal meeting, a case officer has been allocated, (refer to **Appendix C9**).
- » Submission of the Application for Environmental Authorisation to the DEDECT will be done by hard copy submission and WeTransfer to the case officer.
- » Submission of the Scoping Report for review and comment by:
  - \* The competent and commenting authorities.
  - \* State departments that administer laws relating to a matter affecting the environment relevant to an Application for EA.
  - \* Organs of State which have jurisdiction in respect of the activity to which the application relates.

The submissions, as listed above, were undertaken electronically, as required by the DEDECT. A record of all authority correspondence undertaken during the Scoping Phase is included in **Appendix B**.

### 6.5.2. Public Participation Process

Public participation is an essential and regulatory requirement for an environmental authorisation process and is guided by Regulations 41 to 44 of the EIA Regulations 2014 (GN R326) (as amended). The purpose of public participation is clearly outlined in Regulation 40 of the EIA Regulations 2014 (GN R326) (as amended) and is being followed for this proposed project.

The Public Participation Process for Marikana Solar PV1 facility has been run in tandem with the public consultation for the SRPM Solar PV and Karee Solar PV1.

The benefit to the stakeholder is that all information relevant to all related applications has been made available for review together, and not only for comments to be raised across the three applications individually, but also provided a complete picture of the potential for impacts and/or benefits related to the suite of projects.

The sharing of information forms the basis of the public participation process and offers the opportunity for I&APs to become actively involved in the EIA process from the outset. The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner. The public participation process affords I&APs opportunities to provide input into and receive information regarding the EIA process in the following ways:

- » During the **Scoping Phase**:
  - \* provide an opportunity to submit comments regarding the project;
  - \* assist in identifying reasonable and feasible alternatives, where required;
  - \* identify issues of concern to be assessed and addressed in the impact phase;
  - \* suggestions for enhanced benefits;
  - \* contribute relevant local information and knowledge to the environmental assessment;
  - \* allow registered I&APs to verify that their comments have been recorded, considered, and addressed, where applicable, in the environmental investigations;
  - \* foster trust and co-operation;
  - \* generate a sense of joint responsibility and ownership of the environment;
  - \* comment on the findings of the Scoping Phase results; and
  - \* arrange, attend and facilitate relevant Focus Group Meetings (FGMs) and Key Stakeholder Workshop (KSW) to be conducted for the project.
  
- » During the **EIA Phase**:
  - \* contribute relevant local information and knowledge to the environmental assessment;
  - \* verify that issues have been considered in the environmental investigations as far as possible as identified within the Scoping Phase;
  - \* comment on the findings of the environmental assessments; and
  - \* arrange, attend and facilitate relevant FGMs, KSW and Public Meetings, where applicable, to be conducted for the project.
  
- » During the **decision-making phase**:
  - \* to advise I&APs of the outcome of the competent authority's decision, and how and by when the decision can be appealed.

The Public Participation process therefore aims to ensure that:

- » Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review.

- » The information presented during the public participation process is presented in such a manner, i.e., local language and technical issues, that it avoids the possible alienation of the public and prevents them from participating.
- » Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the project.
- » A variety of mechanisms are provided to I&APs to correspond and submit their comments i.e., fax, post, email, telephone, text message (SMS and WhatsApp).
- » An adequate review period is provided for I&APs to comment on the findings of the Scoping and EIA Reports.

In terms of the requirement of Chapter 6 of the EIA Regulations, 2014, as amended, the following key public participation tasks are required to be undertaken:

- » Fix a notice board at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application.
- » Give written notice to:
  - (iii) the owner or person in control of that land if the applicant is not the owner or person in control of the land.
  - (iv) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken.
  - (v) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken.
  - (vi) the municipal councillor of the ward in which the site or alternative site is located and any organisation of ratepayers that represent the community in the area.
  - (vii) the municipality which has jurisdiction in the area.
  - (viii) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (ix) any other party as required by the competent authority.
- » Place an advertisement in one local newspaper announcing the initiation of the EIA and public participation process and the availability of the Scoping Report.
- » Open and maintain a register of I&APs and Organs of State.
- » Release of a Scoping Report for a 30-day review and comment period.
- » Prepare a Comments and Responses Report (C&RR) report which documents the comments received on the EIA process received during the initiation of the EIA and public participation process and during the 30-day review and comment period of the Scoping Report and the responses provided by the project team.

In compliance with the requirements of Chapter 6: Public Participation of the EIA Regulations, 2014, as amended, and the approved Public Participation Plan, the following summarises the key public participation activities implemented. The schematic below provides an overview of the tools that are available to I&APs and stakeholders to access project information and interact with the public participation team to obtain project information and resolve any queries that may arise, and to meet the requirements for public participation.





### **Stakeholder identification and Register of Interested and Affected Parties**

42. A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the competent authority, which register must contain the names, contact details, and addresses of –
- (a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments, or attended meetings with the proponent, applicant, or EAP.
  - (b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
  - (c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

I&APs have been identified through a process of networking and referral, obtaining information from Savannah Environmental's existing stakeholder database of previous projects in the study area, liaison with potentially affected parties in the greater surrounding area and a registration process involving the completion of a reply form which accompanied the Background Information Document (BID) distributed on Monday, 23 May 2022. Key stakeholders and affected and surrounding landowners have been identified and registered on the project database. Other stakeholders are required to formally register their interest in the project through either directly contacting the Savannah Environmental Public Participation team via phone, text message (SMS and WhatsApp), email or fax, or registering their interest via the online stakeholder engagement platform. An initial list of key stakeholders identified and registered is listed in **Table 5.3**.

Table 5.3: Initial list of Stakeholders identified for the inclusion in the project database during the public participation process for MARIKANA Solar PV Facility

<b>Organs of State</b>
<b>National Government Departments</b>
Department Forestry, Fisheries, and the Environment (DFFE)
Department of Mineral Resources and Energy (DMRE)
Department of Agriculture, Land Reform, and Rural Development (DALRRD)
Department of Water and Sanitation (DWS)
<b>Government Bodies and State-Owned Companies</b>
Air Traffic Navigatin Services (ATNS)
Co-Operative Governance & Traditional Affairs
Eskom Holdings SOC Limited
National Energy Regulator of South Africa (NERSA)
South African Civil Aviation Authority (CAA)
South African Heritage Resources Agency (SAHRA)
South African National Roads Agency Limited (SANRAL)
Telkom SA SOC Limited
Transnet SA SOC Limited
<b>Provincial Government Departments</b>
North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDCT)
North West Department of Public Works and Roads (NW DPWR)
North West Department of Agriculture
North West Provincial Heritage Resources Agency ((NW PHRA) – provincial Heritage Authority
<b>Local Government</b>
Bonjala Platinum District Municipality
Madibeng Local Municipality
<b>Commenting Stakeholders</b>
Agri North West (AgriSA)
BirdLife South Africa
Endangered Wildlife Trust (EWT)
Wildlife and Environment Society of South Africa (WESSA)
<b>Landowners</b>
Affected landowners, tenants, and occupiers
Neighbouring landowners, tenants, and occupiers

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C1** for a listing of the recorded parties). In addition to the above-mentioned EIA Regulations, point 4.1 of the DFFE Public Participation Guidelines has also been followed. The register of I&APs contains the names<sup>4</sup> of:

- » all persons who requested to be registered on the database through the use of the online automated registration on Savannah Environmental's website or in writing and disclosed their interest in the project.
- » all Organs of State which hold jurisdiction in respect of the activity to which the application relates; and
- » all persons who submitted written comments or attended virtual meetings (or in-person consultation where sanitary conditions can be maintained).

I&APs have been encouraged to register their interest in the EIA process from the onset of the project, and the identification and registration of I&APs will be on-going for the duration of the EIA process. The database is a working document of I&APs and will be updated throughout the EIA process and will act as a record of all I&APs involved in the public participation process.

#### Advertisements and Notifications

- 40.(2)(a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of –
- (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and
  - (ii) Any alternative site.
- 40.(2)(b) Giving written notice, in any of the manners provided for in section 47D of the Act, to –
- (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken.
  - (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken.
  - (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area.
  - (iv) The municipality which has jurisdiction in the area.
  - (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vi) Any other party as required by the competent authority.
- 40.(2)(c) Placing an advertisement in –
- (i) One local newspaper; or
  - (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations.
- 40.(2)(d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
- 40.(2)(e) Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to –
- (i) Illiteracy.
  - (ii) Disability; or

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<sup>4</sup> Contact details and addresses have not been included in the I&AP database as this information is protected by the Protection of Personal Information Act (No 4 of 2013).

(iii) Any other disadvantage.

The EIA process was announced with an invitation to the Organs of State, potentially affected and neighbouring landowners, and general public to register as I&APs and to actively participate in the process. This was achieved via the following:

- » Compilation of a Background Information Document (BID) (refer to **Appendix C3**) providing technical and environmental details on the project and how to become involved in the EIA process. The BID and the process notification letter announcing the EIA process, notifying Organs of State, potentially affected and neighbouring landowners, as well as registered stakeholders/IAPs of MARIKANA Solar PV Facility, and providing background information of the project and inviting I&APs to register on the project's database were distributed via email on **23 May 2022**. The evidence of the distribution is contained in **Appendix C4** and **Appendix C5** of the Scoping Report. The BID is also available electronically on the Savannah Environmental website (<http://www.savannahsa.com/public-documents/energy-generation>)
- » Placement of site notices announcing the EIA process at visible points along the boundary of the
- » Placement of site notices announcing the EIA process at visible points along the boundary of the development area (i.e., the boundaries of the affected property), in accordance with the requirements of the EIA Regulations on **21 July 2022**. Photographs and the GPS co-ordinates of the site notices are contained in **Appendix C4** of the Scoping Report.
- » Placement of process notices which is not a regulated requirement but to endure that the proposed project is as widely notified as possible, were placed at various public places such as libraries. Photographs and the GPS co-ordinates of these process notices are contained in **Appendix C2** of the Scoping Report.
- » Placement of the process advert in the Rustenburg News newspaper on 17 **June 2022** announcing the proposed MARIKANA Solar PV Facility development and the availability of the Scoping Report for 30-day review and comment period. This advert:
  - » Announced the project and the associated EIA and Public Participation process.
  - » Provided details of how I&APs can become involved in the EIA process, including details of the public participation consultant.
  - » Provided all relevant details to access the Savannah Environmental online stakeholder engagement platform.
- » A copy of the newspaper advert, as sent to the newspaper, and the newspaper advert tear sheet is included in **Appendix C2** of the Scoping Report.
- » Placement of the advertisement in the Platinum Weekly announcing the availability of the Scoping Report for a 30-day review and comment period.
- » A copy of the newspaper advert, as sent to the newspaper and the newspaper advert tear sheet is included in **Appendix C2** of the Scoping Report.
- » The Marikana Scoping Report has been made available for review by Organs of State, Key Stakeholders, and I&APs for a 30-day review and comment period from **17 June 2022** to **18 July 2022**. The Scoping Report and appendices are available on the Savannah Environmental website (<http://www.savannahsa.com/public-documents/energy-generation>). The evidence of distribution of the Scoping Report is included in **Appendix C4** and **Appendix C5** of the Scoping Report.
  - » Focus group meetings (FGMs) will be held with:
    - the commenting authority officials and the District and Local Municipal officials via a virtual platform;
    - affected and adjacent landowners and their occupiers via a virtual platform; and

- o a Key Stakeholder Workshop with various Government Departments & Key Stakeholders via a virtual platform.

### **Public Involvement and Consultation**

In order to accommodate the varying needs of stakeholders and I&APs within the surrounding area, as well as capture their views, comments, issues and concerns regarding the project, various opportunities have been and will continue to be provided to I&APs to note their comments and issues. I&APs are being consulted through the following means:

**Table 5.4:** Public involvement for MARIKANA Solar PV Facility

<b>Activity</b>	<b>Date</b>
Announcement of the EIA process in Rustenburg Herald, a local newspaper: (English advertisement). The tearsheet is included in <b>Appendix C4</b> of the Scoping Report	06 May 2022
Conduct of Community Liaison meetings (meeting notes are included in <b>Appendix C7</b> of the Scoping Report).	24 & 25 March 2022
Distribution of the BID, process notification letters and stakeholder comment and reply form announcing the EIA and public participation process and inviting I&APs to register on the project database and included in <b>Appendix C4</b> and <b>Appendix C5</b> of the Scoping Report.  The BID and electronic reply form was also made available on the online stakeholder engagement platform.	23 May 2022
Placement of site notices at the project site at the development site (proof included in <b>Appendix C4</b> of the Scoping Report).	11 May 2022
Process notices (A3 copy of the site notice) was placed at various public places within the town of Rustenburg to notify the broader public of the proposed project and the EIA and public participation process site (proof included in <b>Appendix C2</b> of the Scoping Report).	11 May 2022
Distribution of notification letters announcing the availability of the Scoping Report for a 30-day review and comment period. This letter was distributed to Organs of State, Government Departments, Ward Councillors, landowners, and I&APs within the surrounding area (including neighbouring landowners) and key stakeholder groups.	15 June 2022
An advertisement, announcing the availability of the Scoping Report for a 30-day review and comment period, including details on how to access the Scoping Report available on Savannah Environmental's website was, placed in Platinum Weekly (English advertisement).	17 June 2022
30-day review and comment period of the Scoping Report.	17 June 2022 – 18 July 2022
Virtual meetings through the use of virtual platforms as determined through discussions with the relevant stakeholder group: <ul style="list-style-type: none"> <li>» Landowners</li> <li>» Commenting Authority (NW DEDEC&amp;T) Officials District and Local Authority Officials</li> <li>» Key Stakeholder Workshop with various Government Departments &amp; Key Stakeholders via a virtual platform.</li> </ul>	To be held during the 30-day review and comment period
On-going consultation (i.e., telephone liaison; e-mail communication) with all I&APs.	Throughout the EIA process

### **Registered I&APs entitled to Comment on the Scoping Report**

- 43.(1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.
- (2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.
- 44.(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.
- (2) Where a person desires but is unable to access written comments as contemplated in sub regulation (1) due to –
- (a) A lack of skills to read or write.
  - (b) Disability; or
  - (c) Any other disadvantage.
- Reasonable alternative methods of recording comments must be provided for.

I&APs registered on the database have been notified by means of a notification letter of the release of the Scoping Report for a 30-day review and comment period, invited to provide comment on the Scoping Report, and informed of the manner in which, and timeframe within which such comment must be made. The report has been made available in soft copies to I&APs. Hard copies can be made available on request where sanitary conditions can be maintained. Copies of the Scoping Report will also be made available on CD and courier, should Savannah Environmental receive such a request.

The Scoping Report has also been made available on the Savannah Environmental website (<https://savannahsa.com/public-documents/energy-generation/>). The notification was distributed prior to commencement of the 30-day review and comment period, on **15 June 2022**. Where I&APs are not able to provide written comments (including SMS and WhatsApp), other means of consultation, such as telephonic discussions are used to provide the I&APs with a platform to verbally raise their concerns and comments on the proposed development.

All comments raised as part of the discussions and written comments submitted during the 30-day review and comment period will be recorded and included in **Appendix C6** of the final Scoping Report.

### **Identification and Recording of Comments**

Comments raised by Organs of State, Key Stakeholders and I&APs from the announcement of the EIA process is included in the Comments and Responses Report (C&RR) and included in **Appendix C8** of the Scoping Report. Comments raised during the Scoping Report's 30-day review and comment period will be included in **Appendix C8** of the Final Scoping Report. These will include comments raised through the use of the Savannah Environmental online stakeholder engagement platform and any other written comments received. The C&RR will include detailed responses from members of the EIA project team and/or the project proponent to the issues and comments raised during the public participation process.

Meeting notes of virtual meetings conducted during the 30-day review and comment period of the Scoping Report and all the telephonic discussions will be included in **Appendix C7** of the Final Scoping Report.

## 5.6. Outcomes of the DFFE Web-Based Screening Tool

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulations 19 and 21 of the EIA Regulations.

The requirement for the submission of a Screening Report (included as **Appendix K** of the Scoping Report) for the MARIKANA Solar PV is applicable as it triggers Regulation 19 of the EIA Regulations, 2014, as amended. Table 6.5 provides a summary of the specialist assessments identified in terms of the screening tool and responses to each assessment from the project team considering the development area under consideration.

**Table 5.5:** Sensitivity ratings from the DFFE's web-based online Screening Tool associated with the development of the MARIKANA Solar PV Facility.

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
Agricultural Impact Assessment	Medium	The scoping study is included in this Scoping Report as Appendix D based on the outcome of the desktop analysis of available data, it has been concluded that the impacts to soils and agriculture will be further assessed during the EIA phase.
Landscape/Visual Impact Assessment	Medium	A Visual scoping study is included as Appendix F in this Scoping Report. A detailed assessment will be undertaken in the EIA Phase of the process.
Archaeological and Cultural Heritage Impact Assessment	Low	A Heritage Screening (which covers both archaeological and cultural aspects of the project site) is included in this Scoping Report as Appendix E. Heritage impacts will be further assessed during the EIA phase.
Palaeontology Impact Assessment	Medium	A Heritage Screening (which covers palaeontological aspects of the project site) is included in this Scoping Report as Appendix E. Paleontological impacts will be further assessed during the EIA phase.
Terrestrial Biodiversity Impact Assessment	Very high	An Ecological scoping study (including flora and fauna) has been undertaken for the PV facility and is included as Appendix D of the Scoping Report. A detailed assessment will be undertaken in the EIA Phase of the process.
Aquatic Biodiversity Impact Assessment	Very high	An Aquatic scoping study has been undertaken for the PV facility and is included as Appendix D of the Scoping Report. A detailed assessment will be undertaken in the EIA Phase of the process.
Civil Aviation Assessment	Medium	The Civil Aviation Authority (CAA) and Air Traffic Navigation Services (ATNS) will be consulted throughout the Scoping/EIA process to obtain input.

Defence Assessment	Low	A defence of military base is not located within close proximity to the PV facility.
RFI Assessment	Medium	The project site under consideration for the development of the MARIKANA Solar PV is located within an area that as classified as having medium sensitivity for telecommunication.
Geotechnical Assessment	The screening report does not indicate a rating for this theme.	A geotechnical study will be undertaken by the applicant as part of the technical studies for the project design.
Socio Economic Assessment	The screening report does not indicate a rating for this theme.	A Social Scoping Assessment has been undertaken and is included in the Scoping Report as Appendix G. A detailed assessment will be undertaken in the EIA Phase of the process.
Plant Species Assessment	Low	An Ecological scoping study (including flora and fauna) has been undertaken for the PV facility and is included as Appendix D of the Scoping Report. A detailed assessment will be undertaken in the EIA Phase of the process.
Animal Species Assessment	Medium	
Avian theme	Very High	An Avifaunal Scoping Assessment has been undertaken and is included in the Scoping Report as Appendix D. A detailed assessment will be undertaken in the EIA Phase of the process.

### 6.6.1. Evaluation of Issues Identified through the Scoping Process

Direct, indirect, and cumulative environmental impacts associated with the project identified during the Scoping Phase have been evaluated through consideration of existing information available for the MARIKANA Solar PV Facility development area.

In order to evaluate issues and assign an order of priority, the following methodology was used to identify the characteristics of each potential issue/impact:

- » The nature, which includes a description of what causes the impact, what will be affected and how it will be affected.
- » The extent, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional or national.
- » Identify sensitive receptors that may be impacted on by the proposed development and the types of impacts that are most likely to occur.
- » The significance of potential impacts in terms of the requirements of the 2014 EIA Regulations (including (nature, significance, consequence, extent, duration and probability of the impacts, the degree to which these impacts:
  - a) Can be reversed.
  - b) May cause irreplaceable loss of resources; and
  - c) Can be avoided, managed, or mitigated.
- » Identify the potential impacts that will be considered further in the EIA Phase through detailed investigations.

The evaluation of the proposed project resulted in a description of the nature, significance, consequence, extent, duration, and probability of the identified issues, as well as recommendations regarding further studies required within the EIA Phase.



### **6.6.2. Finalisation of the Scoping Report**

The final stage of the Scoping Phase entails the recording and capturing of comments received from stakeholders and I&APs on the Scoping Report in order to finalise the Scoping Report for submission to DEDECT for decision-making. All written comments received will be addressed within the C&R Report (**Appendix C8**).

### **5.7. Assumptions and Limitations of the EIA Process**

The following assumptions and limitations are applicable to the EIA process of MARIKANA Solar PV Facility:

All information provided by the developer and I&APs to the environmental team was correct and valid at the time it was provided.

It is assumed that the development area for the solar PV facility identified by the developer represents a technically suitable site for the establishment of MARIKANA Solar PV Facility which is based on the design undertaken by technical consultants for the project.

The development footprint (the area that will be affected during the operation phase) will include the footprint for the PV facility and associated infrastructure (i.e., internal access roads, and the BESS).

The Scoping Phase evaluation of impacts has been largely based on desktop studies as well as the findings of studies which have been completed previously for this specific site. This information has been used to inform this Scoping report and will be verified by specialists in the EIA phase to assess the project development footprint for MARIKANA Solar PV Facility.

### **5.8. Legislation and Guidelines that have informed the preparation of this Scoping Report**

The following legislation and guidelines have informed the scope and content of this Scoping Report:

- » National Environmental Management Act (Act No. 107 of 1998).
- » EIA Regulations of December 2014, published under Chapter 5 of NEMA (as amended).
- » Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations.
- » Department of Environmental Affairs (2017), Integrated Environmental Management Guideline: Guideline on Need and Desirability.
- » Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation; and
- » International guidelines – the Equator Principles, the IFC Performance Standards, the Sustainable Development Goals, World Bank Environmental and Social Framework, and the World Bank Group Environmental, Health, and Safety Guidelines (EHS Guidelines).

Several other Acts, standards or guidelines have also informed the project process and the scope of issues addressed and assessed in this Scoping Report. A review of legislative requirements applicable to the proposed project is provided in **Table 5.5**.

**Table 5.6:** Relevant legislative permitting requirements applicable to MARIKANA Solar PV Facility

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<b>National Legislation</b>			
Constitution of the Republic of South Africa (No. 108 of 1996)	<p>In terms of Section 24, the State has an obligation to give effect to the environmental right. The environmental right states that:</p> <p>“Everyone has the right – To an environment that is not harmful to their health or well-being, and To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: Prevent pollution and ecological degradation, Promote conservation, and Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</p>	Applicable to all authorities	There are no permitting requirements associated with this Act. The application of the Environmental Right however implies that environmental impacts associated with proposed developments are considered separately and cumulatively. It is also important to note that the “right to an environment clause” includes the notion that justifiable economic and social development should be promoted, through the use of natural resources and ecologically sustainable development.
National Environmental Management Act (No 107 of 1998) (NEMA)	<p>The 2014 EIA Regulations have been promulgated in terms of Chapter 5 of NEMA. Listed activities which may not commence without EA are identified within the Listing Notices (GNR 327, GNR 325 and GNR 324) which form part of these Regulations (GNR 326).</p> <p>In terms of Section 24(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>Considering the capacity of the proposed MARIKANA Solar PV Facility project (i.e., contracted capacity of 100MW) and the triggering of Activity 1 of Listing Notice 2 (GNR 325) a full</p>	<p>North West (DEDECT) – Competent Authority</p> <p>DFFE – Commenting Authority</p> <p>North West (DMRE) – Commenting Authority</p>	The listed activities triggered by the proposed project have been identified and are being assessed as part of the EIA process currently underway for the project. The EIA process will culminate in the submission of a Final EIA Report to DEDECT for review and decision-making.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	Scoping and EIA process is required in support of the Application for EA.		
National Environmental Management Act (No 107 of 1998) (NEMA)	<p>In terms of the "Duty of Care and Remediation of Environmental Damage" provision in Section 28(1) of NEMA every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.</p> <p>In terms of NEMA, it is the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.</p>	North West (DEDECT) – Competent Authority	While no permitting or licensing requirements arise directly by virtue of the proposed project, this section finds application through the consideration of potential cumulative, direct, and indirect impacts. It will continue to apply throughout the life cycle of the project.
Environment Conservation Act (No. 73 of 1989) (ECA)	<p>The Noise Control Regulations in terms of Section 25 of the ECA contain regulations applicable for the control of noise in the Provinces of Limpopo, North West, Mpumalanga, Northern Cape, Eastern Cape, and KwaZulu-Natal Provinces.</p> <p>The Noise Control Regulations cover the powers of a local authority, general prohibitions, prohibitions of disturbing noise, prohibitions of noise nuisance, use of measuring instruments, exemptions, attachments, and penalties.</p> <p>In terms of the Noise Control Regulations, no person shall make, produce, or cause a disturbing noise, or allow it to be made, produced, or caused by any person, machine, device or apparatus or any combination thereof (Regulation 04).</p>	<p>North West (DEDECT) – Competent Authority</p> <p>Rustenburg Local Municipality</p>	Noise impacts are expected to be associated with the construction phase of the project. Considering the location of the development area in relation to residential areas and provided that appropriate mitigation measures are implemented, construction noise is unlikely to present a significant intrusion to the local community. There is therefore no requirement for a noise permit in terms of the legislation.
National Water Act (No. 36 of 1998) (NWA)	A water use listed under Section 21 of the NWA must be licensed with the Regional DWS, unless it is listed in Schedule 1 of the NWA (i.e., is an existing lawful use), is permissible under	Regional Department of Water and Sanitation	Areas classified as rivers are extensive throughout the project area for MARIKANA Solar PV Facility as identified in the Aquatic

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>a GA, or if a responsible authority waives the need for a licence.</p> <p>Water use is defined broadly, and includes consumptive and non-consumptive water uses, taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.</p> <p>Consumptive water uses may include taking water from a water resource (Section 21(a)) and storing water (Section 21(b)).</p> <p>Non-consumptive water uses may include impeding or diverting of flow in a water course (Section 21(c)), and altering of bed, banks, or characteristics of a watercourse (Section 21(i)).</p>		<p>Scoping Assessment (Appendix D). As a result, a water use authorisation for the project may be required from the DWS. The process to be undertaken will only be confirmed and completed once a positive EA has been received and the project selected as Preferred Bidder by the DMRE or private off taker. This is in line with the requirements from the DWS.</p>
<p>Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)</p>	<p>In accordance with the provisions of the MPRDA a mining permit is required in accordance with Section 27(6) of the Act where a mineral in question is to be mined, including the mining of materials from a borrow pit.</p> <p>Section 53 of the MPRDA states that any person who intends to use the surface of any land in any way which may be contrary to any object of the Act, or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner.</p>	<p>Department of Mineral Resources and Energy (DMRE)</p>	<p>Any person who wishes to apply for a mining permit in accordance with Section 27(6) must simultaneously apply for an Environmental Authorisation in terms of NEMA. No borrow pits are expected to be required for the construction of the project, and as a result a mining permit or EA in this regard is not required to be obtained.</p> <p>In terms of Section 53 of the MPRDA approval is required from the Minister of Mineral Resources and Energy to ensure that the proposed development does not sterilise a mineral resource that might occur on site.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM: AQA)</p>	<p>The National Dust Control Regulations (GNR 827) published under Section 32 of NEM: AQA prescribe the general measures for the control of dust in all areas and provide a standard for acceptable dust fall rates for residential and non-residential areas.</p> <p>In accordance with the Regulations (GNR 827) any person who conducts any activity in such a way as to give rise to dust in quantities and concentrations that may exceed the dust fall standard set out in Regulation 03 must, upon receipt of a notice from the air quality officer, implement a dust fall monitoring programme.</p> <p>Any person who has exceeded the dust fall standard set out in Regulation 03 must, within three months after submission of the dust fall monitoring report, develop, and submit a dust management plan to the air quality officer for approval.</p>	<p>North West (DEDECT) / Bojanala Platinum District</p>	<p>In the event that the project results in the generation of excessive levels of dust the possibility could exist that a dust fall monitoring programme would be required for the project, in which case dust fall monitoring results from the dust fall monitoring programme would need to be included in a dust monitoring report, and a dust management plan would need to be developed.</p>
<p>National Heritage Resources Act (No. 25 of 1999) (NHRA)</p>	<p>Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance.</p> <p>Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites.</p> <p>Section 36 of the NHRA provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority.</p> <p>Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a listed activity to notify the responsible heritage resources authority and furnish</p>	<p>South African Heritage Resources Agency (SAHRA)</p> <p>North West Provincial Heritage Resources Agency (NW PHRA)</p>	<p>A Heritage Impact Assessment will be undertaken for the project as per the requirements Section 38 of the NHRA. The Heritage Impact Assessment will be made available in the EIA Phase.</p> <p>Should a heritage resource be impacted upon, a permit may be required from SAHRA or The Limpopo Provincial Heritage Resources Authority (LIHRA) and North West Provincial Heritage Resources Agency (NW PHRA) in accordance with of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668).</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>it with details regarding the location, nature, and extent of the proposed development.</p> <p>Section 44 of the NHRA 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.</p>		
<p>National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)</p>	<p>Section 53 of NEM:BA provides for the MEC / Minister to identify any process or activity in such a listed ecosystem as a threatening process.</p> <p>Three government notices have been published in terms of Section 56(1) of NEM:BA as follows:</p> <p>Commencement of TOPS Regulations, 2007 (GNR 150). Lists of critically endangered, vulnerable, and protected species (GNR 151). TOPS Regulations (GNR 152).</p> <p>It 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 (NEM:BA: National list of ecosystems that are threatened and in need of protection, (Government Gazette 37596, GNR 324), 29 April 2014).</p>	<p>DFFE North West (DEDECT)</p>	<p>Under NEM:BA, a permit would be required for any activity that is of a nature that may negatively impact on the survival of a listed protected species.</p> <p>An Ecological Impact Assessment will be undertaken as part of the EIA Phase to identify the presence of any listed protected species present on site which will require a permit.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)</p>	<p>Chapter 5 of NEM:BA pertains to alien and invasive species, and states that a person may not carry out a restricted activity involving a specimen of an alien species without a permit issued in terms of Chapter 7 of NEM:BA, and that a permit may only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out.</p> <p>Applicable, and exempted alien and invasive species are contained within the Alien and Invasive Species List (GNR 864).</p>	<p>DFFE North West (DEDECT)</p>	<p>An Ecological Impact Assessment will be undertaken as part of the EIA Phase to identify the presence of any alien and invasive species present on site.</p>
<p>Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)</p>	<p>Section 05 of CARA provides for the prohibition of the spreading of weeds.</p> <p>Regulation 15 of GN R1048 published under CARA provides for the classification of categories of weeds and invader plants, and restrictions in terms of where these species may occur.</p> <p>Regulation 15E of GN R1048 published under CARA provides requirement and methods to implement control measures for different categories of alien and invasive plant species.</p>	<p>Department of Agriculture, Land Reform and Rural Development (DALRRD)</p>	<p>CARA will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies need to be developed and implemented. In addition, a weed control and management plan must be implemented.</p> <p>In terms of Regulation 15E (GN R1048) where Category 1, 2 or 3 plants occur a land user is required to control such plants by means of one or more of the following methods:</p> <p>Uprooting, felling, cutting, or burning. Treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer. Biological control carried out in accordance with the stipulations of the Agricultural Pests Act (No. 36 of 1983), the ECA and any other applicable legislation.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			<p>Any other method of treatment recognised by the executive officer that has as its object the control of plants concerned, subject to the provisions of sub-regulation 4.</p> <p>A combination of one or more of the methods prescribed, save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.</p>
<p>National Forests Act (No. 84 of 1998) (NFA)</p>	<p>According to this Act, the Minister may declare a tree, group of trees, woodland, or a species of trees as protected. Notice of the List of Protected Tree Species under the National Forests Act (No. 84 of 1998) was published in GNR 734.</p> <p>The prohibitions provide that “no person may cut, damage, disturb, destroy or 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”.</p>	<p>DFFE</p>	<p>A licence is required for the removal of protected trees. It is therefore necessary to conduct a survey that will determine the number and relevant details pertaining to protected tree species present in the development footprint for the submission of relevant permits to authorities prior to the disturbance of these individuals.</p> <p>An Ecological Impact Assessment will be undertaken as part of the EIA Phase to identify the presence of any protected trees present on site which will require a permit.</p>
<p>National Veld and Forest Fire Act (No. 101 of 1998) (NVFFA)</p>	<p>Chapter 4 of the NVFFA places a duty on owners to prepare and maintain firebreaks, the procedure in this regard, and the role of adjoining owners and the fire protection association. Provision is also made for the making of firebreaks on the international boundary of the Republic of South Africa. The applicant must ensure that firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land, it does</p>	<p>DFFE</p>	<p>While no permitting or licensing requirements arise from this legislation, this Act will be applicable during the construction and operation of MARIKANA Solar PV Facility, in terms of the preparation and maintenance of firebreaks, and the need to provide appropriate equipment and trained personnel for firefighting purposes.</p>



Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>not cause soil erosion, and it is reasonably free of inflammable material capable of carrying a veldfire across it.</p> <p>Chapter 5 of the Act places a duty on all owners to acquire equipment and have available personnel to fight fires. Every owner on whose land a veldfire may start or burn or from whose land it may spread must have such equipment, protective clothing and trained personnel for extinguishing fires, and ensure that in his or her absence responsible persons are present on or near his or her land who, in the event of fire, will extinguish the fire or assist in doing so, and take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association, if any.</p>		
<p>Hazardous Substances Act (No. 15 of 1973) (HAS)</p>	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger, to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <p>Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat, or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance</p> <p>Group IV: any electronic product, and</p> <p>Group V: any radioactive material.</p>	<p>Department of Health (DoH)</p>	<p>It is necessary to identify and list all Group I, II, III, and IV hazardous substances that may be on site and in what operational context they are used, stored, or handled. If applicable, a license would be required to be obtained from the DoH.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.</p>		
<p>National Environmental Management: Waste Act (No. 59 of 2008) (NEM: WA)</p>	<p>The Minister may by notice in the Gazette publish a list of waste 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"> <li>Adding other waste management activities to the list.</li> <li>Removing waste management activities from the list.</li> <li>Making other changes to the particulars on the list.</li> </ul> <p>In terms of the Regulations published in terms of NEM: WA (GNR 912), a BA or EIA 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"> <li>The containers in which any waste is stored, are intact and not corroded or in</li> <li>Any other way rendered unfit for the safe storage of waste.</li> <li>Adequate measures are taken to prevent accidental spillage or leaking.</li> <li>The waste cannot be blown away.</li> <li>Nuisances such as odour, visual impacts and breeding of vectors do not arise, and</li> <li>Pollution of the environment and harm to health are prevented.</li> </ul>	<p>DFFE – Hazardous Waste North West (DEDECT) – General Waste</p>	<p>No waste listed activities are triggered by MARIKANA Solar PV Facility; therefore, no Waste Management License is required to be obtained. General and hazardous waste handling, storage and disposal will be required during construction and operation. The National Norms and Standards for the Storage of Waste (GNR 926) published under Section 7(1)(c) of NEM: WA will need to be considered in this regard.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<p>National Road Traffic Act (No. 93 of 1996) (NRTA)</p>	<p>The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</p> <p>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.</p> <p>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.</p>	<p>South African National Roads Agency (SANRAL) – national roads</p> <p>North West Department of Community Safety and Transport Management (NW DCSTM):</p>	<p>An abnormal load / vehicle permit may be required to transport the various components to site for construction. These include route clearances and permits required for vehicles carrying abnormally heavy or abnormally dimensioned loads and transport vehicles exceeding the dimensional limitations (length) of 22m. Depending on the trailer configuration and height when loaded, some of the on-site substation and BESS components may not meet specified dimensional limitations (height and width) which will require a permit.</p>
<p>The Electricity Regulation Act 4 of 2006</p>	<p>Act to establish a national regulatory framework for the electricity supply industry; to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework; to provide for licences and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated; and to provide for matters connected therewith.</p>	<p>The National Energy Regulator of South Africa (NERSA)</p>	<p>The Electricity Regulation Act 4 of 2006 intends:</p> <ul style="list-style-type: none"> <li>• to establish a national regulatory framework for the electricity supply industry.</li> <li>• to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework.</li> <li>• to provide for licences and registration as the manner in which generation, transmission, distribution,</li> </ul>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			trading and the import and export of electricity are regulated; and <ul style="list-style-type: none"> <li>to provide for matters connected therewith.</li> </ul>
Provincial Policies / Legislation			
Bophuthatswana Nature Conservation Act. No. 3 of 1973.	This Act provides for the sustainable utilisation of wild animals, aquatic biota, and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project: Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property. Aquatic habitats may not be destroyed or damaged. The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species. The Act provides lists of protected species for the province.	North West (DEDECT)	A collection/destruction permit must be obtained from Limpopo (DEDET) & North West (DEDECT) for the removal of any protected plant or animal species found on site.  Should these species be confirmed within the development footprint during any phase of the project, permits will be required.  An Ecological Impact Assessment will be undertaken as part of the EIA Phase to identify the presence of any listed species present on site which will require a permit.

### 6.8.1. **Best Practice Guidelines Birds & Solar Energy (2017)**

The Best Practice Guidelines Birds & Solar Energy (2017) proposed by the Birds and Renewable Energy Specialist Group (BARESG) (convened by BirdLife South Africa and the Endangered Wildlife Trust) contain guidelines for assessing and monitoring the impact of solar generation facilities on birds in Southern Africa. The guidelines recognise the impact that solar energy may have on birds, through for example the alteration of habitat, the displacement of populations from preferred habitat, and collision and burn mortality associated with elements of solar hardware and ancillary infrastructure; and the fact that the nature and implications of these effects are poorly understood.

The guidelines are aimed at Environmental Assessment Practitioners (EAPs), avifaunal specialists, developers and regulators and propose a tiered assessment process, including:

- » Preliminary avifaunal assessment – an initial assessment of the likely avifauna in the area and possible impacts, preferably informed by a brief site visit and by collation of available data; also including the design of a site-specific survey and monitoring project should this be deemed necessary.
- » Data collection – further accumulation and consolidation of the relevant avian data, possibly including the execution of baseline data collection work (as specified by the preliminary assessment), intended to inform the avian impact study.
- » Impact assessment – a full assessment of the likely impacts and available mitigation options, based on the results of systematic and quantified monitoring if this was deemed a requisite at preliminary assessment.
- » Monitoring – repetition of baseline data collection, plus the collection of mortality data. This helps to develop a complete before and after picture of impacts, and to determine if proposed mitigation measures are implemented and are effective or require further refinement. Monitoring may only be necessary for projects with the potential for significant negative impacts on birds (i.e., large area affected and / or vulnerable species present).

In terms of the guidelines the quantity and quality of baseline data required to inform the assessment process at each site should be set in terms of the size of the site and the predicted impacts of the solar technology in question, the anticipated sensitivity of the local avifauna (for example, the diversity and relative abundance of priority species present, proximity to important flyways, wetlands, or other focal sites) and the amount of existing data available for the area.

Data collection could vary from a single, short field visit (Regime 1, for e.g., at a small or medium sized site with low avifaunal sensitivity), to a series of multi-day survey periods, including the collection of various forms of data describing avian abundance, distribution and movement and spread over 12 months (Regime 3, for e.g., at a large development located in a sensitive habitat, or which otherwise may have significant impacts on avifauna). **Table 5.7** is taken from the best practise guidelines and provides a summary of the recommended assessment regimes in relation to proposed solar energy technology, project size, and likely risk).

**Table 5.7:** Recommended avian assessment regimes in relation to proposed solar energy technology, project size, and known impact risks.

Type of technology*	Size**	Avifaunal Sensitivity***		
		Low	Medium	High
All except CSP power tower	Small (< 30ha)	Regime 1	Regime 1	Regime 2
	Medium (30 – 150ha)	Regime 1	Regime 2	Regime 2
	Large (> 150ha)	Regime 2****	Regime 2	Regime 3
CSP power tower	All	Regime 3		

Regime 1: One site visit (peak season); minimum 1 – 5 days.

Regime 2: Pre- and post-construction; minimum 2 – 3 x 3 – 5 days over 6 months (including peak season); carcass searches.

Regime 3: Pre- and post-construction; minimum 4 – 5 x 4 – 8 days over 12 months, carcass searches.

- \* Different technologies may carry different intrinsic levels of risk, which should be taken into account in impact significance ratings
- \* For multi-phased projects, the aggregate footprint of all the phases should be used. At 3ha per MW, Small = < 10MW, Medium = 10 – 50MW, Large = > 50MW.
- \* The avifaunal sensitivity is based on the number of priority species present, or potentially present, the regional, national, or global importance of the affected area for these species (both individually and collectively), and the perceived susceptibility of these species (both individually and collectively) to the anticipated impacts of development. For example, an area would be considered to be of high avifaunal sensitivity if one or more of the following is found (or suspected to occur) within the broader impact zone:
  - (i) Avifaunal habitat (e.g., a wetlands, nesting, or roost sites) of regional or national significance.
  - (ii) A population of a priority species that is of regional or national significance.
  - (iii) A bird movement corridor that is of regional or national significance.
  - (iv) A protected area and / or Important Bird and Biodiversity Area.

An area would be considered to be of medium avifaunal sensitivity if it does not qualify as high avifaunal sensitivity, but one or more of the following is found (or suspected to occur) within the broader impact zone

  - (i) Avifaunal habitat (e.g., a wetland, nesting, or roost sites) of local significance.
  - (ii) A locally significant population of a priority species.
  - (iii) A locally significant bird movement corridor.
  - (iv) An area would be considered to be of low avifaunal sensitivity if it does not meet any of the above criteria.
- \* Regime 1 may be applied to some large sites, but only in instances where there is abundant existing data to support the assessment of low sensitivity.

Bird distribution patterns fluctuate widely in response to environmental conditions (e.g., local rainfall patterns, nomadism, migration patterns, seasonality), meaning that a composition noted at a particular moment in time will differ during another time period at the same locality. For this reason, the PV transects are counted 4 times in Spring and then again 4 times in Autumn. The spring survey has already been conducted and the findings has been used to inform the avifauna scoping report completed for the scoping phase. The result from the Autumn season bird monitoring will be used to inform both the development footprint as well as Avifauna Impact Assessment report to be completed for the EIA phase.

### 6.8.2. The IFC Environmental Health and Safety (EHS) Guidelines

- » The IFC EHS Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP). The following IFC EHS Guidelines have relevance to the proposed project:
  - » IFC EHS General Guidelines
  - » IFC Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines, however no Industry Sector EHS Guidelines have been developed for PV solar power to date. The application of the General EHS Guidelines should be tailored to the hazards and risks associated with a project and should take into consideration site-specific variables which may be applicable, such as host country context, assimilative capacity of the environment, and other project factors. In instances where host country regulations differ from the standards presented in the EHS Guidelines, whichever is the more stringent of the two in this regard should be applied.

The General EHS Guidelines include consideration of the following:

- » Environmental:
  - \* Air Emissions and Ambient Air Quality
  - \* Energy Conservation
  - \* Wastewater and Ambient Water Quality
  - \* Water Conservation
  - \* Hazardous Materials Management
  - \* Waste Management
  - \* Noise
  - \* Contaminated Land
- » Occupational Health and Safety:
  - \* General Facility Design and Operation
  - \* Communication and Training
  - \* Physical Hazards
  - \* Chemical Hazards
  - \* Biological Hazards
  - \* Radiological Hazards
  - \* Personal Protective Equipment (PPE)
  - \* Special Hazard Environments
  - \* Monitoring
- » Community Health and Safety:
  - \* Water Quality and Availability
  - \* Structural Safety of Project Infrastructure
  - \* Life and Fire Safety (L&FS)
  - \* Traffic Safety
  - \* Transport of Hazardous Materials
  - \* Disease Prevention
  - \* Emergency Preparedness and Response
- » Construction and Decommissioning:
  - \* Environment
  - \* Occupational Health & Safety
  - \* Community Health & Safety

### **6.8.3. IFC's Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (2015)**

While no Industry Sector EHS Guidelines have been developed for PV Solar Power, the IFC has published a Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (IFC, 2015). Chapter 8 of the Project Developer's Guide pertains to Permits, Licensing and Environmental Considerations, and states that in order to deliver a project which will be acceptable to international lending institutions, environmental and social assessments should be carried out in accordance with the requirements of the key international standards and principles, namely the Equator Principles and IFC's Performance Standards (IFC PS).

Some of the key environmental considerations for solar PV power plants contained within the Project Developer's Guide include:

- » Construction phase impacts (i.e., OHS, temporary air emissions from dust and vehicle emissions, noise related to excavation, construction and vehicle transit, solid waste generation and wastewater generation from temporary building sites and worker accommodation).
- » Water usage (i.e., the cumulative water uses requirements).
- » Land matters (i.e., land acquisition procedures and the avoidance or proper mitigation of involuntary land acquisition / resettlement).
- » Landscape and visual impacts (i.e., the visibility of the solar panels within the wider landscape and associated impacts on landscape designations, character types and surrounding communities).
- » Ecology and natural resources (i.e., habitat loss / fragmentation, impacts on designated areas and disturbance or displacement of protected or vulnerable species).
- » Cultural heritage (i.e., impacts on the setting of designated sites or direct impacts on below-ground archaeological deposits as a result of ground disturbance during construction).
- » Transport and access (i.e., impacts of transportation of materials and personnel).
- » Drainage / flooding (i.e., flood risk associated with the site).
- » Consultation and disclosure (i.e., consultation with key authorities, statutory bodies, affected communities and other relevant stakeholders as early as possible).
- » Environmental and Social Management Plan (ESMP) (i.e., compile an ESMP to ensure that mitigation measures for relevant impacts are identified and incorporated into project construction procedures and contracts).



## CHAPTER 6 DESCRIPTION OF THE RECEIVING ENVIRONMENT

This chapter provides a description of the local environment. This information is provided in order to assist the reader in understanding the possible effects of the project on the environment within which it is proposed to be developed. Aspects of the biophysical, social, and economic environment that could be directly or indirectly affected by, or could affect, MARIKANA solar PV facility have been described. This information has been sourced from both existing information available for the area as well as collected field data by specialist consultants and aims to provide the context within which this EIA process is being conducted.

### 6.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 2: Content of a Scoping report:

Requirement	Relevant Section
(g)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	The environmental attributes associated with the development of MARIKANA solar PV facility is included as a whole within this chapter. The environmental attributes that are assessed within this chapter includes the following:
	The regional setting of the broader study area indicates the geographical aspects associated with MARIKANA solar PV facility. This is included in <b>Section 6.2.</b>
	The climatic conditions for the Rustenburg area have been included in <b>Section 6.3.</b>
	The biophysical characteristics of the project site and the surrounding areas are included in <b>Section 6.4.</b> The characteristics considered are topography and terrain, geology, soils and agricultural potential and the ecological profile which includes the vegetation patterns, listed plant species, critical biodiversity areas and broad-scale processes, freshwater resources, terrestrial fauna, and avifauna.
	The heritage and cultural aspects (including archaeology, cultural landscape, and palaeontology) has been included in <b>Section 6.5.</b>
	The social and socio-economic characteristics associated with the broader study area and the project site has been included in <b>Section 6.6</b>
	The visual quality, land-use and settlement patterns of the affected environment has been included in <b>Section 6.7</b>
The current traffic conditions for the area surrounding the project have been included in <b>Section 6.8</b>	

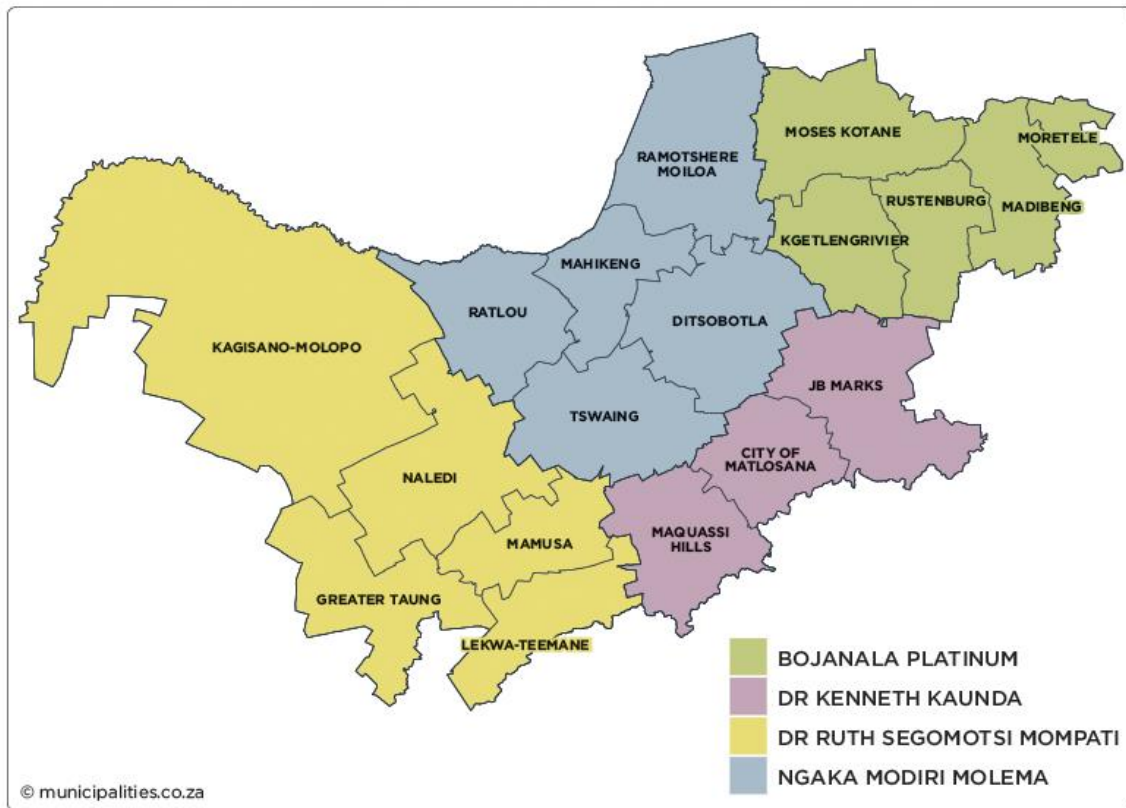
A more detailed description of each aspect of the affected environment is included within the specialist Scoping Reports contained within **Appendices D - L.**

### 6.2. Regional Setting

The MARIKANA solar PV facility development area is located approximately 8km east from the town of Marikana within the Rustenburg Local Municipality and the Bojanala Platinum District Municipality in the North West Province.

The North West Province shares its boundaries with the Free State, Limpopo, and Gauteng provinces, and is the gateway to Botswana. It covers an area of ~104 882km<sup>2</sup>. Much of the Province consists of flat areas of scattered trees and grassland. The Vaal River flows along the southern border of the province. Mahikeng (previously Mafikeng) is the capital, and the largest towns are Mmabatho, Potchefstroom, and Klerksdorp.

The North West Province is divided into four district municipalities which include: Bojanala District Municipality, Ngaka Modiri Molema District Municipality, Dr Ruth Segomotsi District Municipality and Dr Kenneth Kaunda District Municipality, which are further subdivided into twenty-three local municipalities (refer to **Figure 6.1**).



**Figure 6.1:** District municipalities of the Northern West Province (Source: Municipalities of South Africa).

The Bojanala Platinum District Municipality is a Category C municipality situated in the North West Province. The Bojanala Platinum District Municipality (BPDM) is the home of the cradle of humankind and is strategically located on the 'platinum belt' of the north-eastern side of the North West province. To the north the BPDM is surrounded by Waterberg District Municipality (Limpopo Province), Tshwane Metropolitan Municipality (Gauteng Province), West Rand District Municipality (Gauteng Province) to the Southeast. To its south is Dr Kenneth Kaunda District Municipality and the Ngaka Modiri Molema District Municipality to the west. The seat of Bojanala Platinum is Rustenburg. (Source: Municipalities of South Africa).

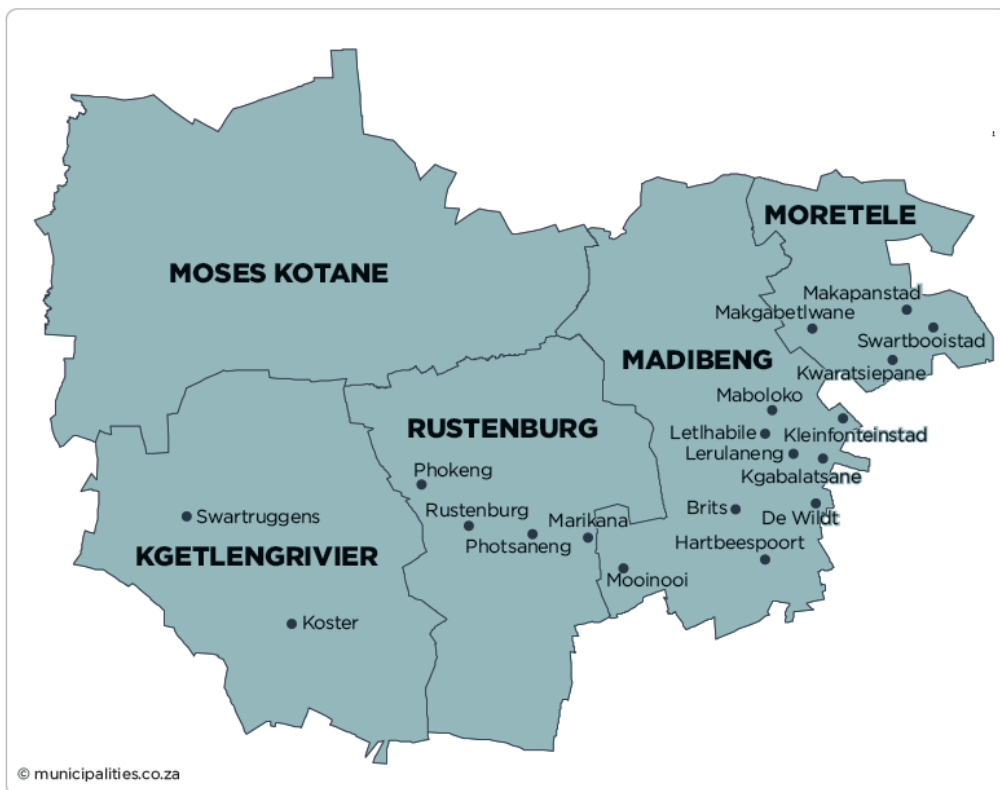
The Bojanala Platinum District Municipality accounts for a total population of 1.81 million, or 44.5% of the total population in the North-West Province, which is the most populous District in the North-West Province for 2018. The ranking in terms of the size of Bojanala Platinum compared to the other District remained the same between 2008 and 2018. The Bojanala District spans over 18 333km<sup>2</sup>, and has 5 local municipalities (Kgetleng River, Madibeng, Moses Kotane, Moretele and Rustenburg) with a total of 139 wards.

The district is amongst the least deprived in the North West Province, with only 8 wards that can be deemed as vulnerable. The least vulnerable people live in the Rustenburg Local Municipality. The Main Economic Sectors are mining (30-35%), community services (15-20%), finance (10-15%), trade (10-15%), transport (5-10%), and manufacturing (5-10%). The district consists of rural municipalities, the rural development will require more resources (Financial, Infrastructure etc) to curb the deficiencies. It should be noted that the villages are scattered apart, the distances from main supplier pipes require more money and infrastructure. The backlog for development of internal roads, or provincial roads is affected also by the distances.

Electricity is also a challenge that needs to be addresses. The unemployment amongst the youth needs attention, whereby industrialisation should be funded to improve skills amongst the youth (Source: Municipalities of South Africa).

The Bojanala District Municipality is spread over former homeland areas, commercial farms, towns, and semi-urban areas, with large areas of land under the custodianship of traditional authorities. According to the BPDMD IDP, 32% of the total land area of the district is under the control of traditional authorities. There are thirty - one (31) senior traditional leaders and twenty – one (21) headman/headwomen within the district.

Approximately 63% of the total economic activity of North West is concentrated into the 4 local economies of Madibeng, Rustenburg, Mahikeng and Matlosana Municipalities. These municipalities represent approximately 50% of the North West population and 58% of the North West labour force. The mining sector is the largest within Bojanala Platinum District Municipality accounting for R 71.5 billion or 52.1% of the total GVA in the district municipality's economy. The district holds the largest Platinum Group Metal reserves in the country and the country holds 80% of the world's reserves. Consequently, it contributes by over 20% to the national mining economy.



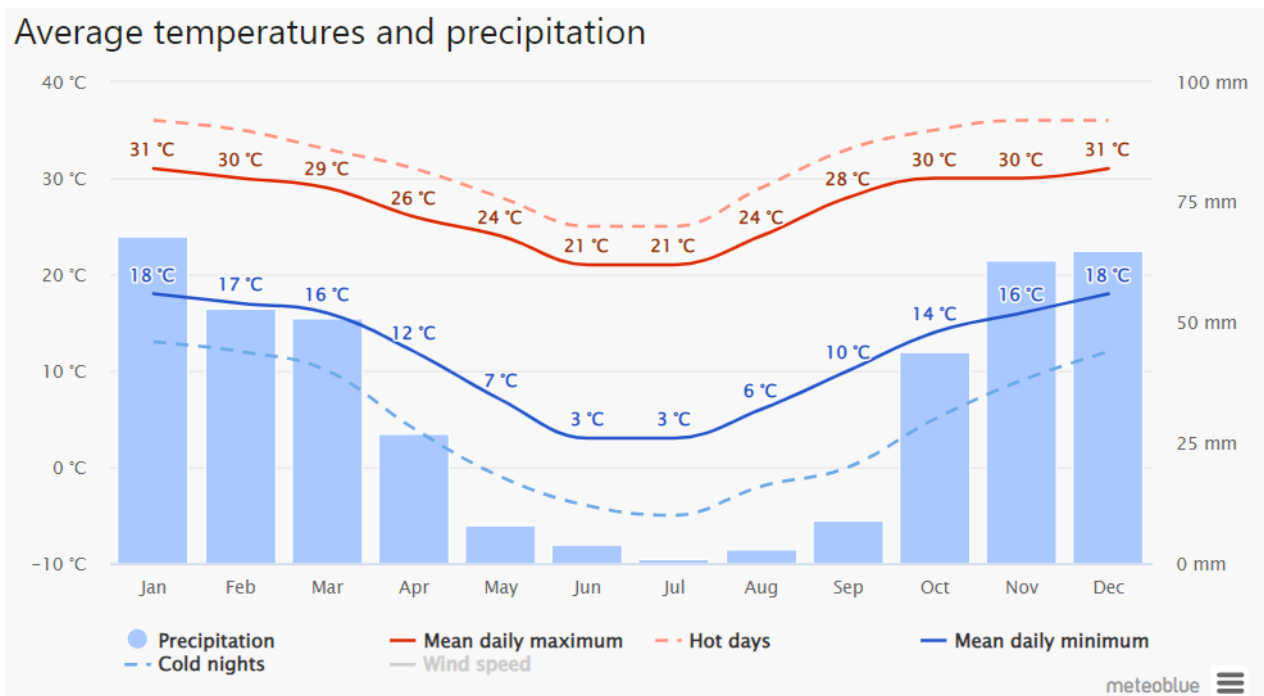
**Figure 6.2:** Map showing the Bonjana Platinum District and local municipalities (Source: Municipalities of South Africa)

The primary economic sector in this district is Mining, which generates more than half of the District's Gross Domestic Product (GDP). The district also produces Platinum, Chrome, Diamond, Slate and Silica. In the context of the Bojanala District, the bulk of platinum mining activity is located in the Rustenburg Local Municipal area. The platinum mining belt runs parallel to the north of the Magalies Mountain which extends from the Pilanesberg right up to the City of Tshwane to the Far East. Also evident is the concentration of informal settlements along the mining belt. Secondly, Agriculture is the most prominent land use in the BPDMD particularly in the Madibeng and Kgetleng River municipal areas. The district has a dualistic agricultural economy, which is comprised of a well-developed commercial sector and a predominantly subsistence

sector in communal areas. Agriculture contributes to approximately 2,6% to the total GDP and 19% to formal employment within the district. Some of the largest cattle herds are to be found in the area thus the nickname "Texas of South Africa", with the area around Rustenburg and Brits being fertile for mixed-crop farming. From a labour-intensive growth perspective, the sector remains strategic to the growth of the district.

**6.3. Climatic Conditions**

The red line in Figure 6.3 below indicates the mean daily maximum temperature in the region, ranging between 20°C in winter and 31°C in summer, while the blue line indicates the mean daily minimum temperature, which ranged between 3°C in winter and 18°C in summer months. The maximum temperatures in summer can reach approximately 35°C, while in winter, the number of days that frost occurs can reach up to 8 days in July. The mean annual precipitation ranges from a minimum of 1mm per month in winter to a maximum of 75mm per month in summer (Meteoblue, 2022).



**Figure 6.3:** Climate graph for the Rustenburg area, North West Province within which the proposed project site is located (source: Meteoblue 2022)

The Rustenburg Local Municipality is a Category B municipality situated within the Bojanala Platinum District in the North West Province.

#### 6.4. Biophysical Characteristics of the Study Area and Development Area

The following section provides an overview and description of the biophysical characteristics of the study area and has been informed by specialist studies (Appendix D-K) undertaken for this Scoping Report.

##### 7.4.1. Topographical profile

The slope percentage of the project areas has been calculated. Most of the project area is characterised by a slope percentage between 0 and 10%, with some smaller patches within the project area characterised by a slope percentage ranging from 10 to 30%. Slopes in excess of 10% are largely associated with mining infrastructure.

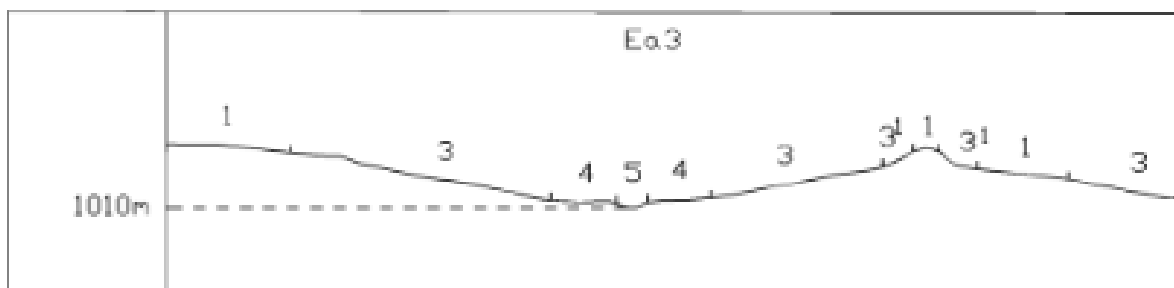
The study area occurs on land that does not range much in elevation of 1 155m. The terrain of the site is predominantly flat.

##### 7.4.2. Geology, Soils and Agricultural Potential

The geology of the study area is characterised by norite, gabbro, pyroxenite and anorthosite of the Bushveld Complex. Occasional dykes of syenite and diabase.

According to the land type database (Land Type Survey Staff, 1972-2006) the project area is located within the Ea3 land type. The dominant soil form within this land type includes the Arcadia form (70.2%), and shallow Mispah / rocky outcrops (15.9%). The remaining soil forms, each with comprising less than 10% of the land type include Hutton (3.9%), Shortlands (3.2%), Rensburg (6.0%) and Swartlands (0.9%). The land terrain unit for the featured land type is illustrated.

Based on the above land type data and soil characteristics, for a land type to be classed as the dominant land type, more than 40% of the land type must fall within a specific category. the dominant land capability for the project area is a Class III., this means that it is low capability.



**Figure 6.5:** Illustration of land type Ea. 70 terrain unit (Land Type Survey Staff, 1972 - 2006)

##### 7.4.3. Land Use

The land uses in the area to the immediate west, east and south of the site are dominated by mining activities associated with Sibanye Stillwater operations. This includes a large tailings dams located ~ 500m and 700m to the east and west of the site respectively and the Horsy Shaft ~ 600m to the south. The Tharisa Platinum Mine and its associated activities is located ~7.4km to the south west (Figure 3.5). The adjacent study area

has therefore been significantly altered by mining related activities. There are therefore no sensitive social receptors located within the immediate vicinity of the site.

The residential land uses to the west and north west include, Marikana and Wonderkop located ~ 2.5 km to the west and north west of the site respectively. The residential areas to the east and south east of the site include Segwaelane (3km north east) and Maroelakop (3km east), and Bapong and Modderspruit (7km south east). The town of Brits is located ~ 20km to the east of the site.

The N4 are located ~ 5km to the south of the site and a railway line runs parallel to and along the northern boundary of the site. The southern boundary of the site is formed by the Graeme Sinclair Road.

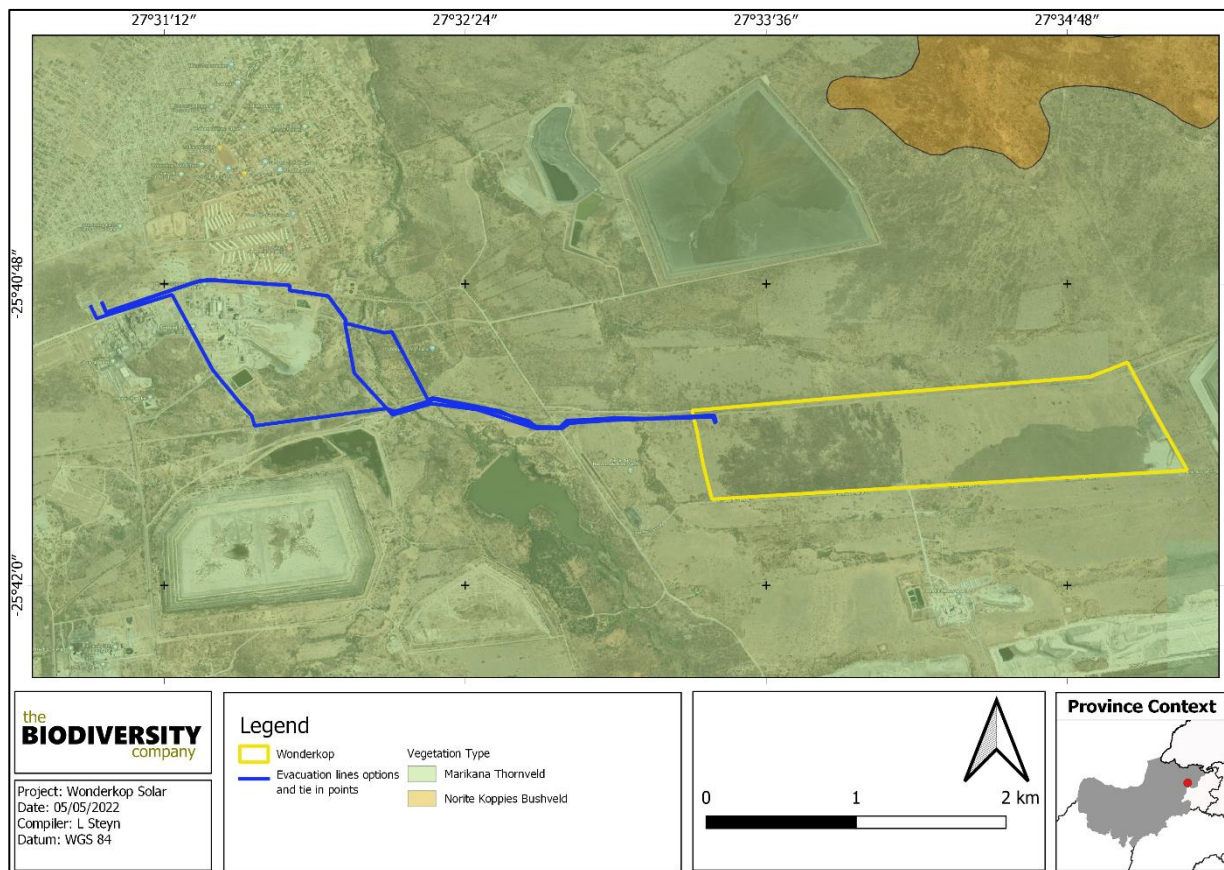
#### **7.4.4. Ecological Profile of the Study Area and the Development Area**

##### **i. Vegetation Type**

The project area is situated in the Savanna biome. The savanna vegetation of South Africa represents the southern-most extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the Savanna biome include:

- » Seasonal precipitation; and
- » (Sub) tropical thermal regime with no or usually low incidence of frost (Mucina & Rutherford, 2006).

Most savanna vegetation communities are characterised by an herbaceous layer dominated by grasses and a discontinuous to sometimes very open tree layer (Mucina & Rutherford, 2006). The savanna biome is the largest biome in South Africa, extending throughout the east and north-eastern areas of the country. Savannas are characterised by a dominant grass layer, over-topped by a discontinuous, but distinct woody plant layer. At a structural level, Africa's savannas can be broadly categorised as either fine-leaved (microphyllous) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by microphyllous woody plants of the Mimosaceae family (Common genera include Acacia and Albizia) and a generally dense herbaceous layer (Scholes & Walker, 1993).



**Figure 6.6:** Vegetation map of the project site showing that the MARIKANA solar PV facility falls within the Marikana Thornveld vegetation type.

On a fine-scale vegetation type, the project area overlaps with the Marikana Thornveld vegetation type.

### Marikana Thornveld

The Marikana Thornveld vegetation type occurs in valleys and slightly undulating plains. Dense growth of shrubs can be found along drainage lines on termitaria and rocky outcrops. Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006).

#### Important Taxa:

- » **Tall Trees:** *Senegalia burkei*.
- » **Small Trees:** *Senegalia caffra*, *Vachellia gerrardii*, *Vachellia karroo*, *Combretum molle*, *Searsia lancea*, *Ziziphus mucronata*, *Vachellia nilotica*, *Vachellia tortilis* subsp. *heteracantha*, *Celtis africana*, *Dombeya rotundifolia*, *Pappea capensis*, *Peltophorum africanum*, *Terminalia sericea*.
- » **Tall Shrubs:** *Euclea crispa* subsp. *crispa*, *Olea europaea* subsp. *africana*, *Searsia pyroides* var. *pyroides*, *Diospyros lycioides* subsp. *guerkei*, *Ehretia rigida* subsp. *rigida*, *Euclea undulata*, *Grewia flava*, *Pavetta gardeniifolia*.
- » **Low Shrubs:** *Asparagus cooperi*, *Rhynchosia nitens*, *Indigofera zeyheri*, *Justicia flava*.
- » **Woody Climbers:** *Clematis brachiata*, *Helinus integrifolius*.
- » **Herbaceous Climbers:** *Pentarrhinum insipidum*, *Cyphostemma cirrhosum*.
- » **Graminoids:** *Elionurus muticus*, *Eragrostis lehmanniana*, *Setaria sphacelata*, *Themeda triandra*, *Aristida scabrivalvis* subsp. *scabrivalvis*, *Fingerhuthia africana*, *Heteropogon contortus*, *Hyperthelia dissoluta*, *Melinis nerviglumis*, *Pogonarthria squarrosa*.

- » **Herbs:** *Hermannia depressa*, *Ipomoea obscura*, *Barleria macrostegia*, *Dianthus mooiensis* subsp. *mooiensis*, *Ipomoea oblongata*, *Vernonia oligocephala*.
- » **Geophytic Herbs:** *Ledebouria revoluta*, *Ornithogalum tenuifolium*, *Sansevieria aethiopica*.

ii. Conservation Status of Broad Vegetation Type

This vegetation type is classified as Endangered (EN), with its national conservation target being 19%. More than 48% has already been transformed by urban expansion and cultivation.

iii. Expected Flora Species

Expected Flora Species

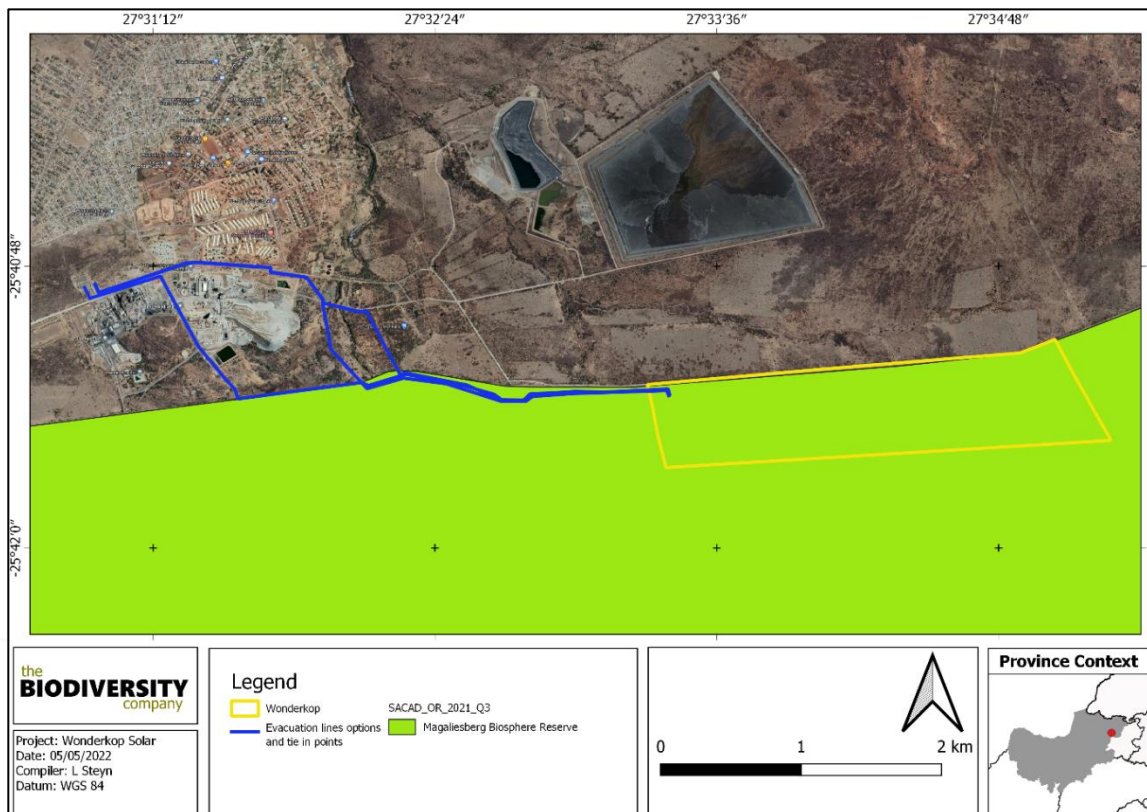
The POSA database indicates that 351 species of indigenous plants are expected to occur within the project area. One (1) SCC based on their conservation status could be expected to occur within the project area and are provided in **Table 6.1** below.

**Table 6.1:** Threatened flora species that may occur within the project area.

Family	Taxon	Author	IUCN	Ecology
Crassulaceae	Adromischus umbraticola subsp. umbraticola	C.A.Sm.	NT	Indigenous; Endemic

iv. Protected Areas within the Broader Project Site

According to the protected area spatial datasets from SACAD (2021), the project area overlaps with the Magaliesberg Biosphere Reserve. No SAPAD reserves are found within 5 km of the project area (**Figure 6.7**).

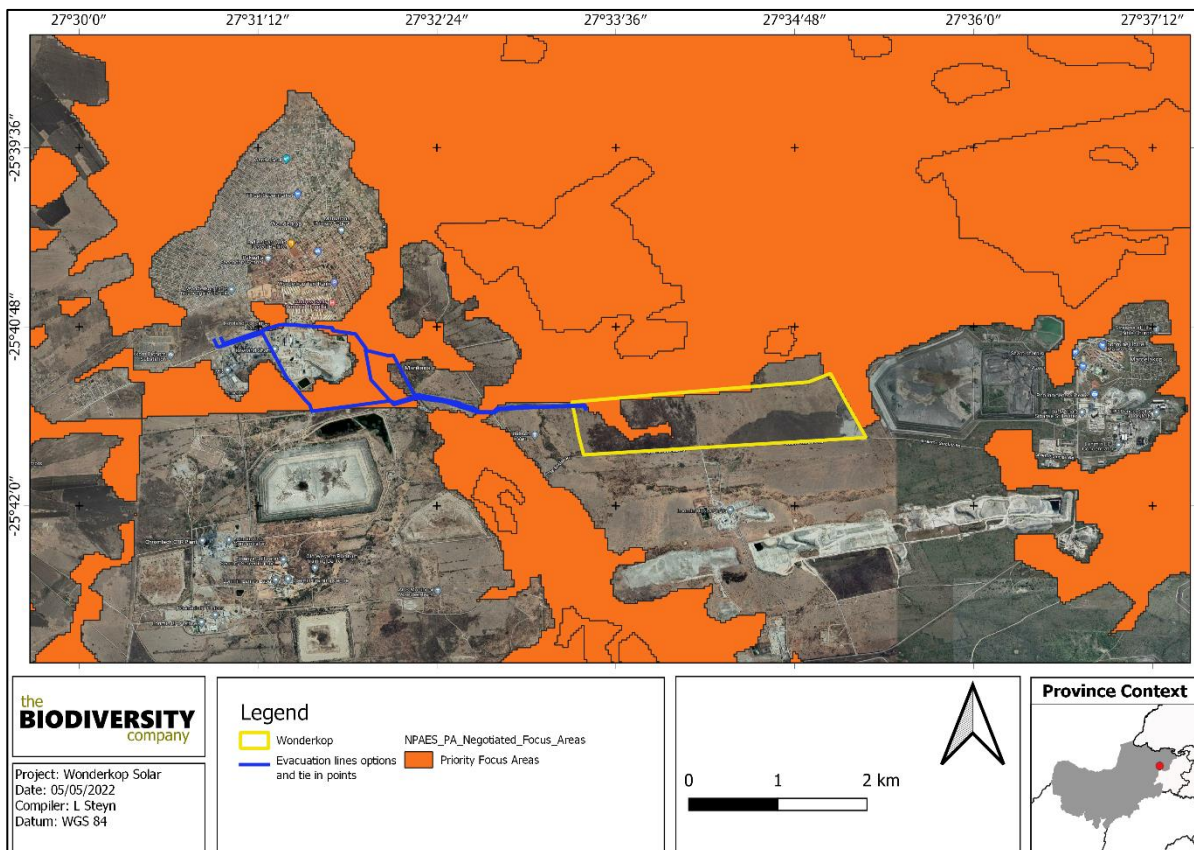


**Figure 6.7** The project area in relation to the protected areas



National Protected Area Expansion Strategy

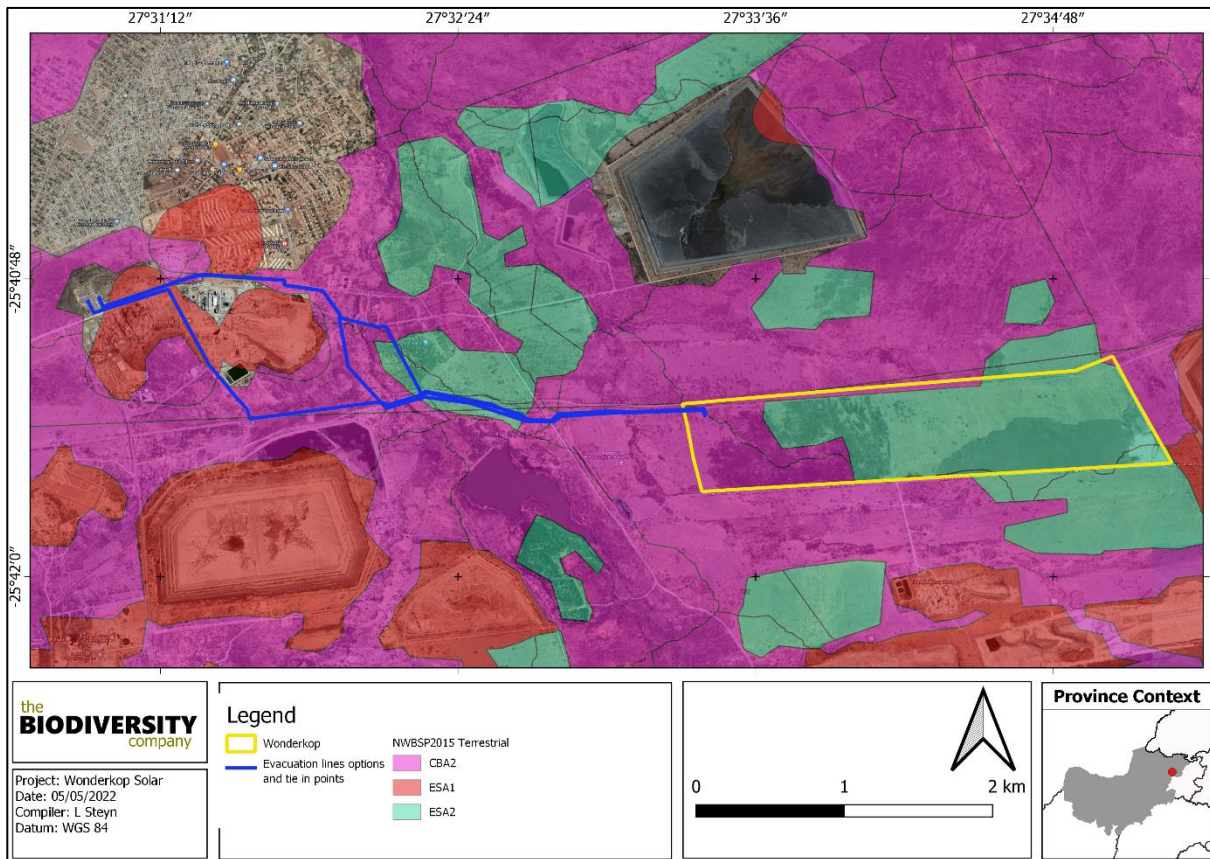
National Protected Area Expansion Strategy 2016 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine-scale planning which may identify a range of different priority sites based on local requirements, constraints, and opportunities (NPAES, 2016). The project area does not overlap with a NPAES priority focus area as can be seen in **Figure 6.8**.



**Figure 6.8.** The project area in relation to the National Protected Area Expansion Strategy

v. Critical Biodiversity and Ecological Support Areas

The conservation of CBAs is crucial, in that if these areas are not maintained in a natural or near-natural state, biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity compatible land uses and resource uses (SANBI-BGIS, 2017). **Figure 6.9** shows the project area superimposed on the Terrestrial CBA maps. The project area overlaps with CBA2, ESA1, and ESA2 classified areas.

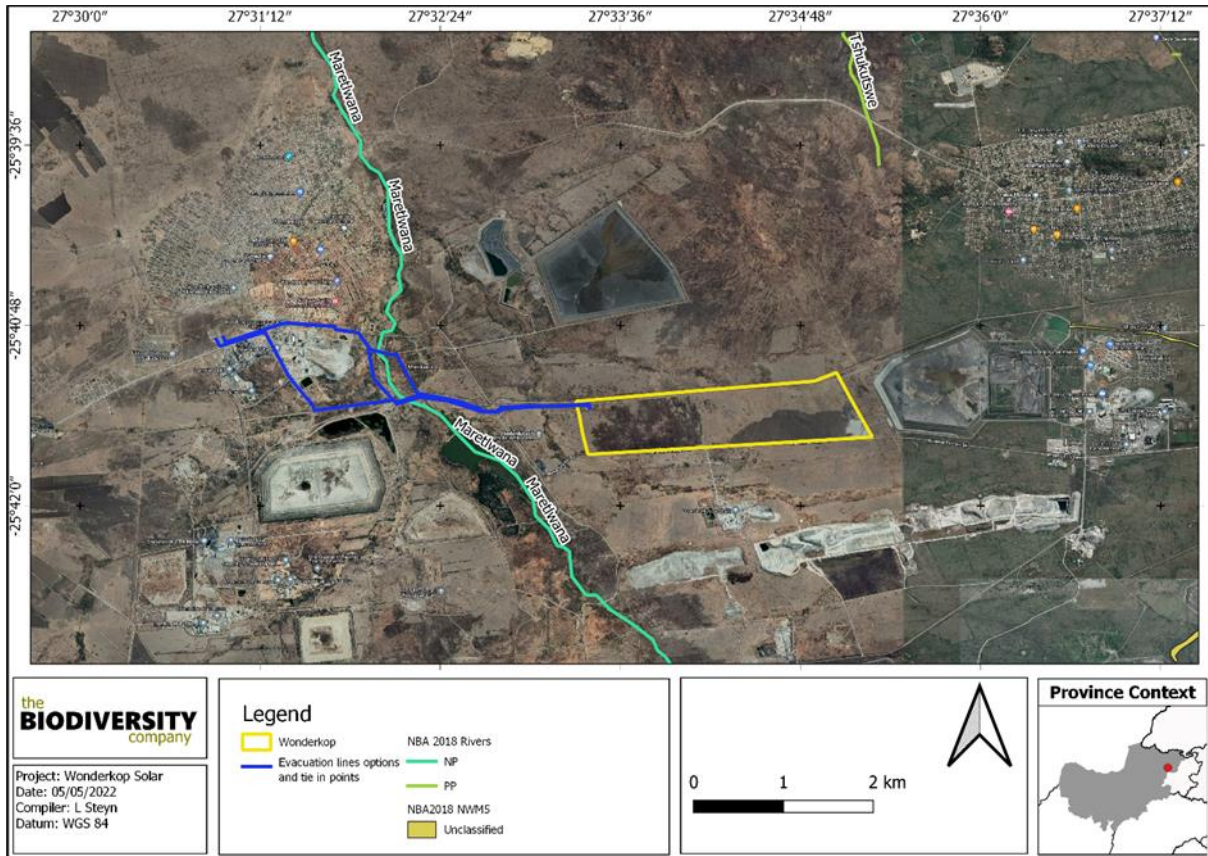


**Figure 6.9:** Critical Biodiversity Areas (CBAs), as per the North West CBA spatial data, located within the MARIKANA PV project site

vi. Wetlands and Freshwater Resources

**Aquatic Ecosystems**

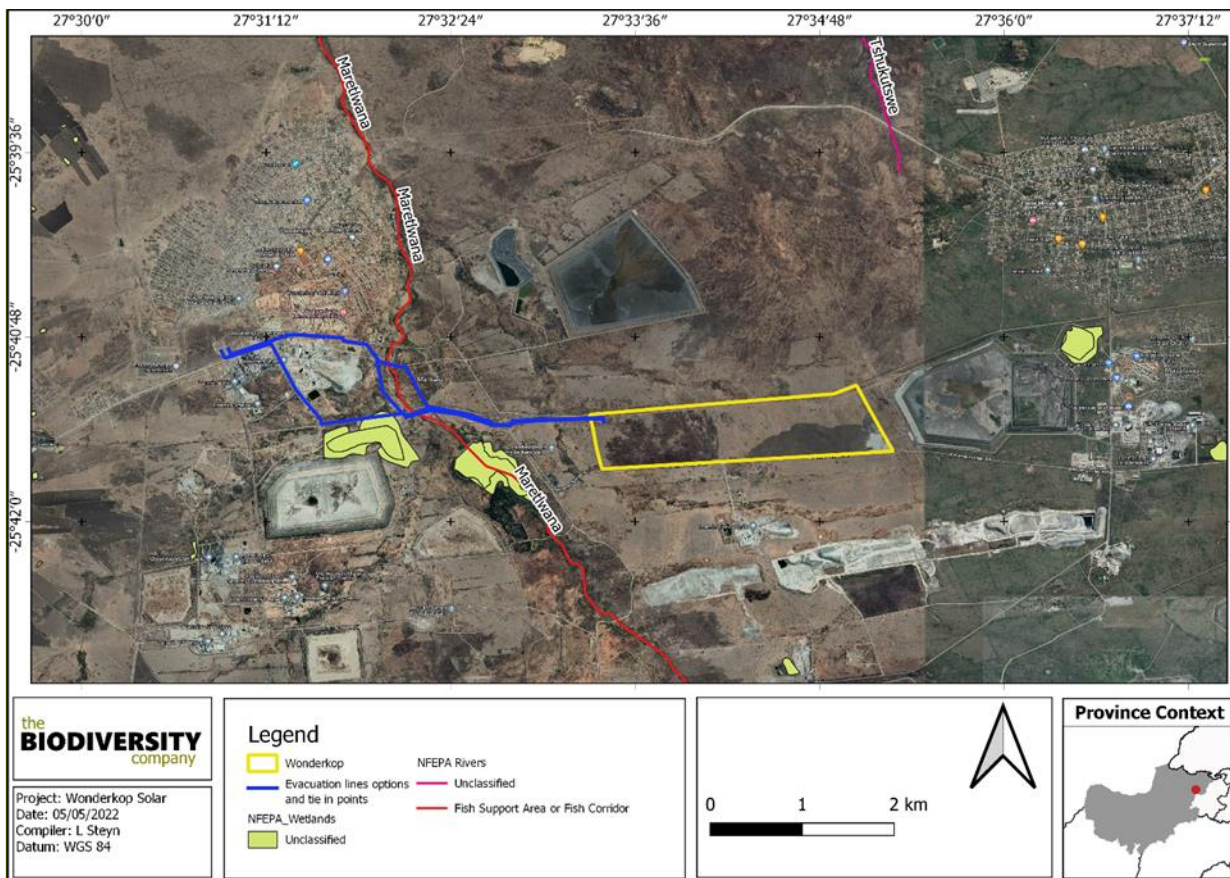
The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer et al., 2019; Skowno et al., 2019). The project area overlaps with a NP river



**Figure 6.10:** Illustration of ecosystem threat status of rivers and wetland ecosystems in the project area

**National Freshwater Ecosystem Priority Area Status**

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver et al., 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEM:BA) biodiversity goals (Nel et al., 2011). **Figure 6.11** shows the project area overlaps with an unclassified FEPA wetland and a FEPA river.



**Figure 6.11:** Location of the project site in relation to wetland FEPAs.

vii. Terrestrial Fauna Communities in the Study Area

**Mammals**

The IUCN Red List Spatial Data lists 93 mammal species that could be expected to occur within the area (The full list will be provided in the final assessment). This list excludes large mammal species that are normally restricted to protected areas. Fifteen (15) of these expected species are regarded as threatened (**Table 6.2**), twelve of these have a low likelihood of occurrence based on the lack of suitable habitat and food sources in the project area.

**Table 6.2:** Threatened mammal species that are expected to occur within the project area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT	Low
<i>Atelerix frontalis</i>	South Africa Hedgehog	NT	LC	Moderate
<i>Cloeotis percivali</i>	Short-eared Trident Bat	EN	LC	High
<i>Crocidura mariquensis</i>	Swamp Musk Shrew	NT	LC	Low
<i>Eidolon helvum</i>	African Straw-colored Fruit Bat	LC	NT	Low
<i>Felis nigripes</i>	Black-footed Cat	VU	VU	Low
<i>Hydrictis maculicollis</i>	Spotted-necked Otter	VU	NT	Low
<i>Leptailurus serval</i>	Serval	NT	LC	Moderate
<i>Mystromys albicaudatus</i>	White-tailed Rat	VU	EN	Low
<i>Ourebia ourebi</i>	Oribi	EN	LC	Low
<i>Panthera pardus</i>	Leopard	VU	VU	Low
<i>Parahyaena brunnea</i>	Brown Hyaena	NT	NT	Low

<i>Pelea capreolus</i>	Grey Rhebok	NT	NT	Low
<i>Poecilogale albinucha</i>	African Striped Weasel	NT	LC	Low
<i>Redunca fulvorufula</i>	Mountain Reedbuck	EN	EN	Low

- » **Atelerix frontalis** (South African Hedgehog) has a tolerance to a degree for habitat modification and occurs in a wide variety of semi-arid and sub-temperate habitats (IUCN, 2017). Based on the Red List of Mammals of South Africa, Lesotho, and Swaziland (2016), *A. frontalis* populations are decreasing due to the threats of electrocution, veld fires, road collisions, predation from domestic pets and illegal harvesting. Suitable habitat might occur in the project area therefore the species has a moderate likelihood of occurrence.
- » **Cloeotis percivali** (Short-eared Trident Bat) occurs in savanna areas where there is sufficient cover in the form of caves and mine tunnels for day roosting (IUCN, 2017). It feeds exclusively on moths and appears to be very sensitive to disturbance. Suitable habitat and roosting area can be found around the project area and therefore the likelihood of finding this species is rated as high.
- » **Leptailurus serval** (Serval) occurs widely through sub-Saharan Africa and is commonly recorded from most major national parks and reserves (IUCN, 2017). The Serval's status outside reserves is not certain, but they are inconspicuous and may be common in suitable habitat as they are tolerant of farming practices provided there is cover and food available. In sub-Saharan Africa they are found in habitat with well-watered savanna long-grass environments and are particularly associated with reedbeds and other riparian vegetation types. Some areas of suitable habitat are present for this species in the project area, as such the likelihood of occurrence is rated as moderate.

### Amphibians

Based on the IUCN Red List Spatial Data and Amphibian Map, 26 amphibian species are expected to occur within the area (The full list will be provided in the final assessment). One (1) is regarded as threatened (

#### Table 6.3).

**Table 6.3:** Threatened amphibian species that are expected to occur within the project area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	NT	LC	Low

- » **Giant Bull Frog** (*Pyxicephalus adspersus*) is a species of conservation concern that will possibly occur in the project area, especially in the area with the wetlands. The Giant Bull Frog is listed as near threatened on a regional scale. It is a species of drier savannas where it is fossorial for most of the year, remaining buried in cocoons. They emerge at the start of the rains, and breed in shallow, temporary waters in pools, pans, and ditches (IUCN, 2017). Based on the lack of water sources in the project area, this species was given a low likelihood of occurrence.

### Reptiles

Based on the IUCN Red List Spatial Data and the Reptile MAP database, 80 reptile species are expected to occur within the area (The full list will be provided in the final assessment). Two (2) are regarded as threatened (Table 6.3).

**Table 6.3:** Threatened reptile species that are expected to occur within the project area

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Crocodylus niloticus</i>	Nile Crocodile	VU	VU	Low
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	NT	LC	Moderate

- » **Crocodylus niloticus** (Nile Crocodile) is listed as VU on a regional basis. The Nile crocodile is quite widespread throughout sub-Saharan Africa, in different types of aquatic environments such as lakes, rivers, and marshlands. Due to the lack of suitable water sources in the project area the likelihood of occurrence is rated as Low.
- » **Homoroselaps dorsalis** (Striped Harlequin Snake) is partially fossorial and known to inhabit old termitaria in grassland habitat (IUCN, 2017). Most of its range is at moderately high altitudes, reaching 1,800 m in Mpumalanga and Swaziland, but it is also found at elevations as low as about 100 m in KwaZulu-Natal. The likelihood of occurrence was rated as moderate.

viii. Avifauna

### Important Bird and Biodiversity Areas (IBA)

The SABAP2 Data lists 346 avifauna species that could be expected to occur within the area (The full list will be provided in the final assessment). Fourteen (14) of these expected species are regarded as threatened. Eleven of the species have a low likelihood of occurrence due to lack of suitable habitat and food sources in the project area. The likelihood of occurrence is also related to the disturbed nature of the project area. Some of the larger birds might fly over but it is unlikely that they would be residents on site.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared	NT	LC	Low
<i>Aquila rapax</i>	Eagle, Tawny	EN	VU	Low
<i>Aquila verreauxii</i>	Eagle, Verreaux's	VU	LC	Low
<i>Calidris ferruginea</i>	Sandpiper, Curlew	LC	NT	Low
<i>Ciconia abdimii</i>	Stork, Abdim's	NT	LC	Low
<i>Coracias garrulus</i>	Roller, European	NT	LC	Moderate
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC	High
<i>Falco vespertinus</i>	Falcon, Red-footed	NT	NT	Moderate
<i>Gyps coprotheres</i>	Vulture, Cape	EN	EN	Low
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	VU	Low
<i>Phoeniconaias minor</i>	Flamingo, Lesser	NT	NT	Low
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	EN	Low
<i>Pterocles gutturalis</i>	Sandgrouse, Yellow-throated	NT	LC	Low
<i>Rostratula benghalensis</i>	Painted-snipe, Greater	NT	LC	Low

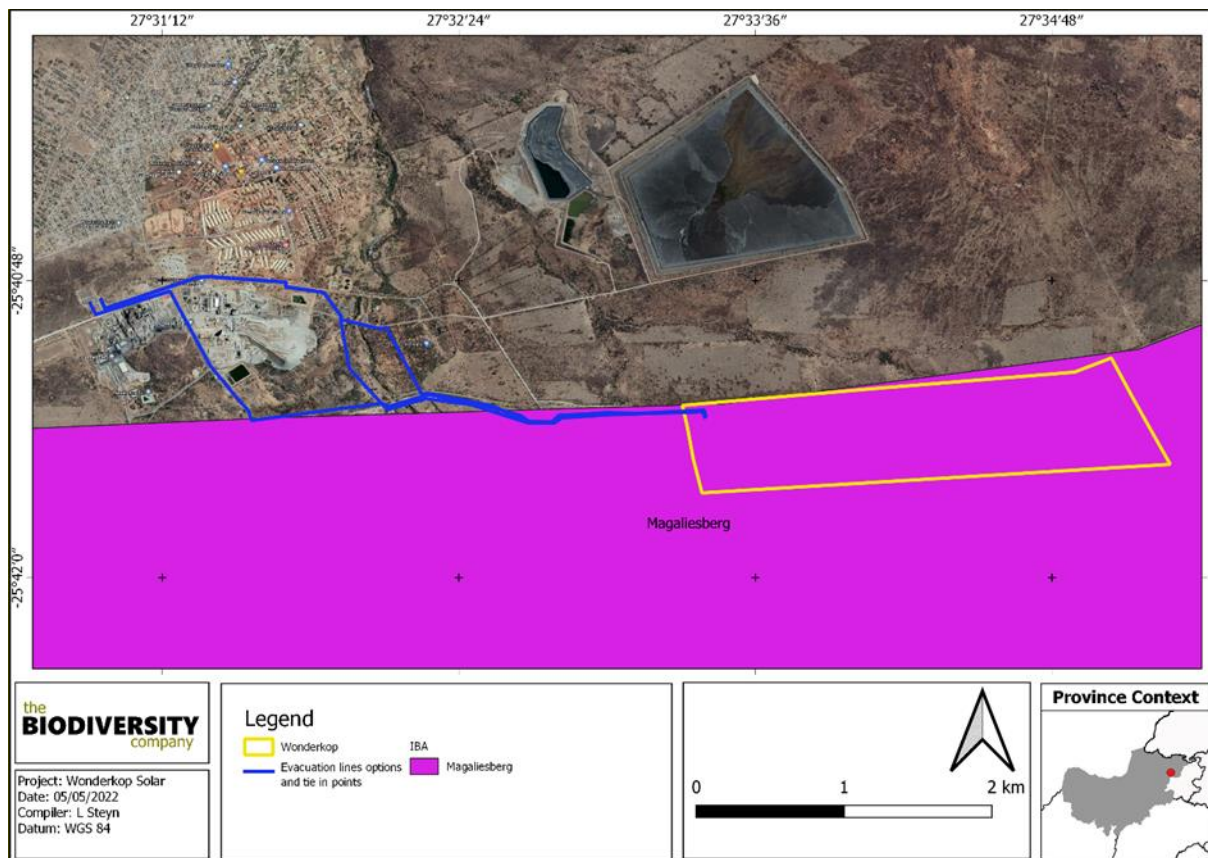


Figure 6.12: The project area in relation to the Magaliesberg IBA

Table 6.4: Threatened avifauna species that are expected to occur within the project area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
<i>Alcedo semitorquata</i>	Kingfisher, Half-collared	NT	LC	Low
<i>Aquila rapax</i>	Eagle, Tawny	EN	VU	Low
<i>Aquila verreauxii</i>	Eagle, Verreaux's	VU	LC	Low
<i>Calidris ferruginea</i>	Sandpiper, Curlew	LC	NT	Low
<i>Ciconia abdimii</i>	Stork, Abdim's	NT	LC	Low
<i>Coracias garrulus</i>	Roller, European	NT	LC	Moderate
<i>Falco biarmicus</i>	Falcon, Lanner	VU	LC	High
<i>Falco vespertinus</i>	Falcon, Red-footed	NT	NT	Moderate
<i>Gyps coprotheres</i>	Vulture, Cape	EN	EN	Low
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	VU	Low
<i>Phoeniconaias minor</i>	Flamingo, Lesser	NT	NT	Low
<i>Polemaetus bellicosus</i>	Eagle, Martial	EN	EN	Low
<i>Pterocles gutturalis</i>	Sandgrouse, Yellow-throated	NT	LC	Low
<i>Rostratula benghalensis</i>	Painted-snipe, Greater	NT	LC	Low

- » **Coracias garrulus** (European Roller) is a winter migrant from most of South-central Europe and Asia occurring throughout sub-Saharan Africa (IUCN, 2017). The European Roller has a preference for bushy plains and dry savannah areas (IUCN, 2017). There is a moderate chance of this species occurring in the project area as they prefer to forage in open areas.
- » **Falco biarmicus** (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (IUCN, 2017). They may occur in groups up to 20 individuals

but have also been observed solitary. Their diet is mainly composed of small birds such as pigeons and francolins. The likelihood of incidental records of this species in the project area is rated as high due to the presence of many bird species on which Lanner Falcons may predate.

- » **Falco vespertinus** (Red-footed Falcon) is known to breed from eastern Europe and northern Asia to north-western China, heading south in the non-breeding season to southern Angola and southern Africa. Within southern Africa it is locally uncommon to common in Botswana, northern Namibia, central Zimbabwe, and the area in and around Gauteng, South Africa (Hockey et al., 2005). The habitat it generally prefers is open habitats with scattered trees, such as open grassy woodland, wetlands, forest fringes and croplands. Some of these habitats are present in the project area and thus the likelihood of occurrence is rated as moderate.

## 6.5. Integrated Heritage including Archaeology, Palaeontology, and the Cultural Landscape

Sibanye Stillwater's proposed new Marikana Solar PV Facility will be established between existing facilities, industries, and mines which amongst others include the K3 Concentrator (east), the Siphumele Complex (north-east) and the Hoedspruit Tailings Storage Facility (north-west). The proposed project area covers an adjustable piece of land up to 123ha. The land is owned by Sibanye-Stillwater with the closest electrical tie-in points being the Wonderkop substation.

### 7.5.1. State of Site

The central part of the project area includes a wide array of demolished mine infrastructure which also borders on a railway line which serves as the northern perimeter of this proposed development area. According to earlier Google imagery the project by and large was covered with agricultural fields in the past. Consequently, the project area shows the result of been ploughed, planted, and harvested probably over a prolonged period in the past. The project area is also bisected in two halves with a tar road with avenues of trees on both sides of the road which used to serve the mine infrastructure.

The Project Area in general, can be defined as a brown field since it has been scarred by a mixture of agricultural and mining related activities during the past decades. These activities therefore have changed the indigenous vegetation, landscape, and appearance of the project area to such an extent that it cannot be described as a pristine any longer.

### 7.5.2. Archaeology

Several heritage studies for different mines, Eskom power lines, and other developmental projects have been conducted beyond the project area during the last two to three decades. A number of these studies are listed. According to these heritage studies the following main types and ranges of heritage resources occur in the broader area, namely:

- » Stone walled settlements dating from approximately AD1700. However, these settlements are mainly confined to rocky outcrops in the area. The sites are usually small and do not cover extensive surface areas such as contemporary stone walled sites elsewhere in the Bankeveld.
- » Other settlements dating from the Late Iron Age (AD1700 to AD1820) but without stone walls also occur, but their numbers are limited. They are also characterised by little archaeological remains such as potsherds and other artefacts. These sites are also mostly severely eroded and of low heritage significance. Some of these settlements may even be associated with LSA artefacts. These sites are limited in numbers, mostly severely eroded and of low heritage significance.



- » Graveyards younger and older than sixty years. The numbers of graves in these cemeteries vary from single graves to large cemeteries holding more than hundred graves.
- » Settlements dating from the historical period with potsherds and 'modern' material items such as glass, metal wares and even porcelain. However, these sites are scarce, therefore seldom found and are also mostly severely eroded and of low heritage significance.
- » Historical farmsteads with main residential houses and limited other outbuildings and other infrastructure such as tobacco and wagon sheds, kraals, etc. these types of historical sites are becoming scarcer to find because these infrastructures are mostly, illegally, demolished.
- » Limited mine infrastructure which may be older than sixty years.

The most common types and ranges of heritage resources in the larger project area therefore include Late Iron Age stone walled sites (if kopjes occur) and graveyards.

Databases kept and maintained at institutions such as the PHRA, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and SAHRA's national archive (referred to as the South African Heritage Resources Information System, (SAHRIS) were consulted to determine whether any heritage resources of significance had been identified during earlier heritage surveys in or near the project area. The larger project area has been subjected to several heritage assessments studies in the past.

As a result of the absence of any heritage resources in the project area no significance rating for any heritage resources or for the possible impact of the MARIKANA PV Solar Facility Project on any heritage resources was undertaken.

## 6.6. Visual Quality

The study area is situated within the Bojanala Platinum District, so called due to the predominantly platinum and chrome mining activities within the region. The region historically had a stronger agricultural economy (in the 1960s) with tobacco, maize, soya, and sunflower amongst some of the major crops produced. In the 1970s mining was introduced and grew to become the main economic driver of the area. The mining activities have since then greatly influenced the settlement patterns and socio-economic structure of the region.

The study area is located north of the N4 national road and north of the Magaliesberg mountain range. The topography of the region is predominantly described as plains and strongly undulating plains, with hills (Norite Koppies) to the north. The terrain elevation ranges from approximately 1,095m above sea level to the north and 1,395m to the south-west, south of Rustenburg. This town is the main commercial distribution centre within the region and the most populous city in the North West Province (population approximately 550,000).

The Hex River traverses east of Rustenburg and west of the SRPM PV facility site. The Sterkstroom and Marelwane Rivers traverse in between the Marikana and Karee PV facility sites. These rivers flow north-wards, respectively towards the Vaalkop and Beestekraal Dams. Other than these perennial rivers there are a number of non-perennial tributaries and dams (primarily mine dams) within the study area.

The remaining natural land cover and vegetation of the study area is described as *Marikana Thornveld*. This veld type consists of a combination of trees and bushes (open, closed and sparse) and grassland, with various levels of degradation. The level of vegetation transformation is clearly illustrated on the land cover map (**Map 2**) where the agricultural, mining and settlement patterns are shown. Some of the old agricultural fields are regenerating and slowly returning to their natural status. The hills mentioned above are *Norite*

*Koppies Bushveld* veld types and the far south of the study area (primarily south of the N4 national road) is *Moot Plains Bushveld*.

The most prominent (and visible) land use within the region is the mining activities, mining infrastructure and mine dumps. Interspersed with these mining activities are agricultural land uses, ranging from irrigated agriculture to the south-west, dryland agriculture to the north and citrus farming (orchards) to the south-east. Agricultural activities include the production of maize, wheat and sun flower crops, as well as cattle farming. The farmers working these fields predominantly reside at homesteads or farm residences scattered throughout the study area.

Towns or residential areas primarily associated with the mines in the region include:

- Modderspruit
- Makolokwe
- Marikana
- Mooinooi
- Segwaelane
- Makolokwe
- Thekwane
- Mfidike
- Waterval
- Photsaneng
- Nkaneng

The N4 national road provides access to the region and is the main connecting route in between the Gauteng Province (Pretoria) and Rustenburg. The proposed PV facility sites are all accessible from the N4 via secondary roads from near Kroondal (SRPM and Karee sites) and from near Mooinooi (Marikana site).

Besides the large number of mines and mining infrastructure within the study area, there are numerous power lines and substations, predominantly associated with the mines. The largest substation is the Bighorn 275/88kV Main Transmission System (MTS) substation near Marikana. The other substations earmarked for the grid connection points of the PV facilities are the Paardekraal 88/11kV (SRPM connection), Karee 88/33kV (Karee connection) and Wonderkop 88/6.6kV (Marikana connection) substations.

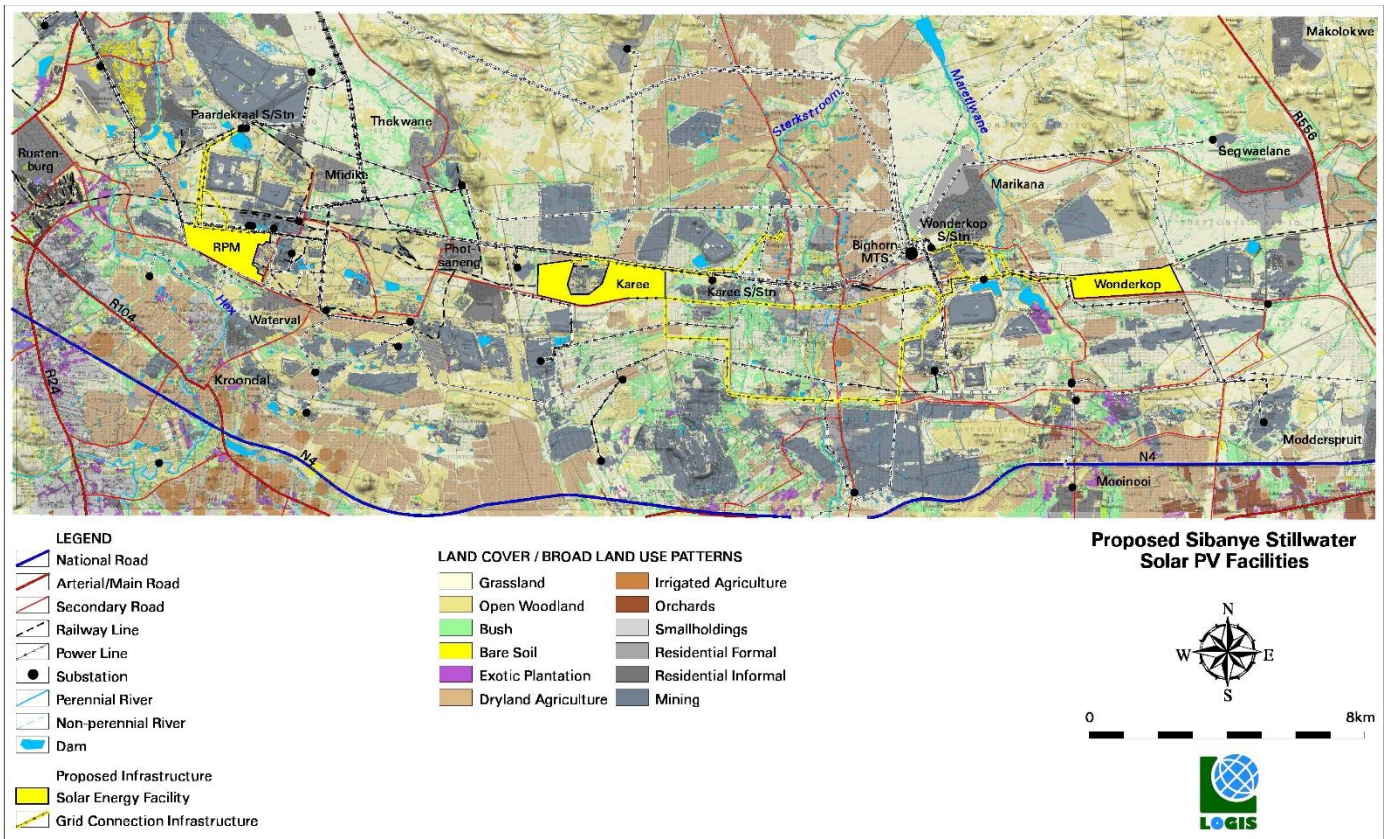


Figure 6.13: Land cover and broad land use patterns of the study area

### 6.7. Traffic

It is envisaged that the components for the PV facility will be imported to South Africa via the Port of Durban or the Port of Richards Bay as the closest ports to the site.

The Port of Durban is located approximately 729km south-east of the site, and the Port of Richards Bay is located approximately 764km south-east of the site. The travel routes to the site from the ports comprise mostly high order routes and the solar PV panels are expected to be delivered by vehicles within the freight limitations. Road geometry limitations are thus not envisaged. Due to the short travel distance to site, the Port of Durban is considered the preferred port of entry. It must however be noted that the availability at any of the considered ports will need to be confirmed with the Transnet Port authority.

In South Africa, more than half (52%) of the manufacturing industry's national workforce resides in three metros - Johannesburg, Cape Town, and eThekweni. It is therefore anticipated that elements that can be manufactured within South Africa will be transported to the site from the Cape Town, Johannesburg, or Pinetown/Durban areas. Components will be transported to site using appropriate National and Provincial routes. It is expected that the components will generally be transported to site with normal heavy load vehicles.

The proposed site is located in Rustenburg, North West Province. The road network surrounding the site comprises of the D108, private roads and unnamed roads. Based on TRH26, D108 functions as a rural Class 3 minor arterial. The surrounding road network comprises of surfaced roads with one lane per direction and gravel shoulders. There are no formalised provisions made for pedestrian facilities within the surrounding road network reserve.

Access to the project site is possible through the use of three existing Mine access roads. As the site will be accessed via existing access points, access spacing restrictions are not envisaged. Accesses 1 and 3 are located off fairly straight roads thus sight line issues are not envisaged. Access 2 located east of the site connects off a gravel road with a horizontal curve.

## **6.8. Social Context**

### **7.8.1. Profile of the Broader Area**

#### **Population**

The population of the RLM in 2016 was 626 522 (Community Household Survey 2016). Of this total, 34% were under the age of 18, 63% were between 18 and 64, and the remaining 3% were 65 and older. The figures for the economically active age group of 18-65 for the BDM and North West were 58.8% and 57.7% respectively. The RLM IDP (2021/22) indicates that the population of the RLM in 2020 was 719 000.

The dependency ratio is the ratio of non-economically active dependents (usually people younger than 15 or older than 64) to the working age population group (15-64). The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates reduced revenue for local authorities to meet the growing demand for services. The national dependency ratio in 2011 was 52.7%, while the North West Province was 54.5%. The traditional approach is based people younger than 15 or older than 64. The information provided provides information for the age group under 18. The total number of people falling within this age group will therefore be higher than the 0-15 age group. However, most people between the age of 15 and 17 are not economically active (i.e., they are likely to be at school).

Using information on people under the age of 18 is therefore likely to represent a more accurate reflection of the dependency ratio. Based on these figures, the dependency ratios for the RLM in 2016 was 58.7%. The relatively low dependency ratio compared to other LMs reflects the employment and economic opportunities associated with the mining sector in the area.

In terms of race groups, Black Africans made up 93.1% of the population on the RLM, followed by Whites, 6.1% and Coloureds, 0.6%. The main first language spoken in the RLM and was Setswana, 63.9% followed by Isixhosa (10.1%) and Afrikaans (5.6%).

#### **Households and house types**

There were a total number of 262 576 (2016) households in the RLM. Of these 51.2% (were formal houses, 29% were shacks and 13.8% were flats in backyards. A high percentage of the dwellings in the RLM are therefore informal structures. The high number of informal structures reflects the influx of jobseekers to the area in search of employment associated with the mining sector and the challenges faced by the local authorities in terms of addressing the housing backlog. In terms of ownership, 36% of the households in the RLM owned and had fully paid off their houses, and 9% were in the process of paying them off. 30% of the households rented their properties, while 14.4% occupied their properties rent free. The figures in terms of ownership and properties being fully paid off were lower than the rate for the BDM (54.9%) and North West (56.3%). This is likely due the higher property prices in Rustenburg and issues associated with affordability.

In terms of household heads, 24.3% of the households in the RLM were headed by women. This figure was lower than the district (30.1%) and provincial (35.2%) figure. This is due to the employment opportunities linked to the mining sector in the RLM and the reduced need for men to leave their homes and seek work

elsewhere. Despite the figures for the RLM being lower than the district and provincial averages, women headed households tend to be more vulnerable.

### **Household income**

Based on the data from the 2011 Census, 17.6% of the households in the RLM had no formal income, 2.8% earned less than R 4 800, 4.2% earned between R 5 000 and R 10 000 per annum, 11.2% between R 10 000 and R 20 000 per annum and 17.4% between R 20 000 and 40 000 per annum.

The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of 53.2% of the households in the RLM live close to or below the poverty line. This figure was lower than the district (61.8%) and provincial (66.9%) figure. The lower poverty levels in the RLM are linked to the employment and income opportunities are largely associated with the mining sector. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. Low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the RLM. This in turn impacts on the ability of the RLM to maintain and provide services.

Household income levels are likely to have been impacted by the COVID-19 pandemic. The number of households in the RLM that live close to or below the poverty line is likely to have increased over the last 18 months. This, coupled with the high dependency ratio, is a major cause of concern for the area.

### **Employment**

The official unemployment rate in the RLM in 2016 was 17.7%, while 49.2% were employed, and 30.3% were regarded as not economically active. The unemployment rates for the RLM are lower than the Provincial rate of 17.1% and the district rate of 18.8%. However, the COVID-19 pandemic is likely to have resulted in an increase in unemployment rates in the RLM. Recent figures released by Stats South Africa also indicate that South Africa's unemployment rate is in the region of 36%, the highest formal unemployment rate in the world.

### **Education**

In terms of education levels, the percentage of the population over 20 years of age in the RLM with no schooling was 4.8% (2016), compared to 8.7% and 5.5% for the North West Province and BDM in 2016 respectively. The percentage of the population over the age of 20 with matric was in the RLM was 36.3%, compared to 31% (2016) and 34.1% for the North West and BDM respectively. The higher education levels are linked to the well-developed infrastructure and services in the RLM, which in turn are linked to the benefits associated with the mining sector.

## **MUNICIPAL SERVICES**

### **Electricity**

Based on 2016 survey, 84.6% of households in the RLM had access to electricity, while 11.2% had no access to electricity. Of the households that had access to electricity, 76.7% had in house pre-paid meters, and 7.9% had conventional meters.

### **Access to water**

Based on the 2016 survey information, 95.2% of households in the RLM were supplied by a local or regional service provider, while 4.8% relied on their own sources. Of the households supplied by service providers,

54.5% had piped water in their yards and 31% had piped water in their houses, while 9.3% relied on community stands or taps. The relatively low number of households with piped water in their houses reflects the high percentage of shacks (29%) in the RLM.

### **Sanitation**

59.3% of the households in the RLM had access to flush toilets (2016), while 36.1% relied on pit toilets and 1.9% did not have access to formal sanitation. The high percentage of households that relied on pit toilets reflects the high percentage of shacks (29%) in the RLM.

### **Refuse collection**

72.6% of the households in the RLM had access to regular refuse removal service, while 12.2% disposed of their waste at their own dump and 4.4% had no access to refuse services (2016).

## CHAPTER 7 SCOPING OF POTENTIAL ISSUES

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This chapter serves to describe environmental issues and potential impacts (direct, indirect, and cumulative impacts) that have been identified to be associated with the development of the MARIKANA Solar PV and associated infrastructure, and to make recommendations for further studies required to be undertaken in the EIA Phase. The scoping process has involved the review of existing information (including previous detailed studies undertaken), limited field work, input from the project proponent and specialist consultants.

Environmental issues associated with construction and decommissioning activities of the project may include, among others:

- » impacts on biodiversity (fauna, flora, and ecological integrity).
- » loss of habitat.
- » soil erosion; and
- » impacts on, and/or benefits to the social environment and current land use.

Environmental issues specific to the operation of a solar PV could include

- » avian mortality resulting from collisions with solar panels; and mortality, injury, and disturbance to faunal species.
- » visual impacts; and
- » impacts on, and/or benefits to the social environment.

Benefits during both the construction and operation phases include:

- » the creation of employment and business opportunities,
- » and the opportunity for skills development and on-site training,
- » improvement in energy security and support towards the renewable sector,
- » benefits for local landowners,
- » and benefits associated with socio-economic contributions to community development.

The development area considered for the proposed MARIKANA PV facility includes Portion 9 of Farm Middelkraal No. 466, comprising an area of approximately 220 ha in extent, which has been investigated during this Scoping Phase to determine the environmental suitability of the site. This will provide an indication of the areas of sensitivity that the developer would need to take into consideration during the planning of the PV within the development area.

**Section 7.2** provides a summary of the findings of the desktop scoping study undertaken for the construction, operation, and decommissioning phases of the MARIKANA PV. Those impacts associated with construction can also be expected to be associated with the decommissioning phase (however, to a lesser extent as the development footprint would have previously undergone transformation and disturbance during construction). More detail regarding potential impacts is included in the specialist scoping reports included in Appendix D-H.

A summary of the potential cumulative impacts that may be associated with the project is provided in **Section 7.3**. These impacts are associated with the scale of the project when considered together with other similar developments within the region and will be confirmed and assessed within the EIA Phase of the project.

## 7.1. Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter serves to identify the potential environmental impacts associated with the development of the MARIKANA Solar PV Facility from a desktop level. This chapter includes the following information required in terms of the EIA Regulations, 2014 - Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(g)(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration, and probability of such identified impacts, including the degree to which these impacts (aa) can be reversed (bb) may cause irreplaceable loss of resources and (cc) can be avoided, managed, or mitigated.	The impacts and risks identified to be associated with the construction and operation phase of MARIKANA Solar PV Facility have been included in <b>Section 7.3</b> . Impact tables have been included for each field of study which considers the nature, significance, consequence, extent, duration, and probability of the impacts, as well the reversibility of the impacts, the loss of resources and avoidance, management, or mitigation.
(g)(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	The positive and negative impacts associated with the MARIKANA Solar PV Facility have been included in <b>Section 7.3</b> .
(g)(viii) the possible mitigation measures that could be applied and level of residual risk	Possible mitigation (specifically relating to the avoidance of sensitive areas) has been included in <b>Section 7.3</b> .



## 7.2. Evaluation of Potential Impacts associated with the Construction Phase, Operation and Decommissioning phases

### 8.2.1. Impacts on ecology (including flora and fauna)

Anthropogenic activities drive habitat destruction causing displacement of fauna and flora and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area.

The terrestrial habitat expected in the project area consists of Marikana Thornveld and is classified as an EN threatened ecosystem. The footprint of the proposed PV plant is surrounded by numerous mining activities and has historically been disturbed.

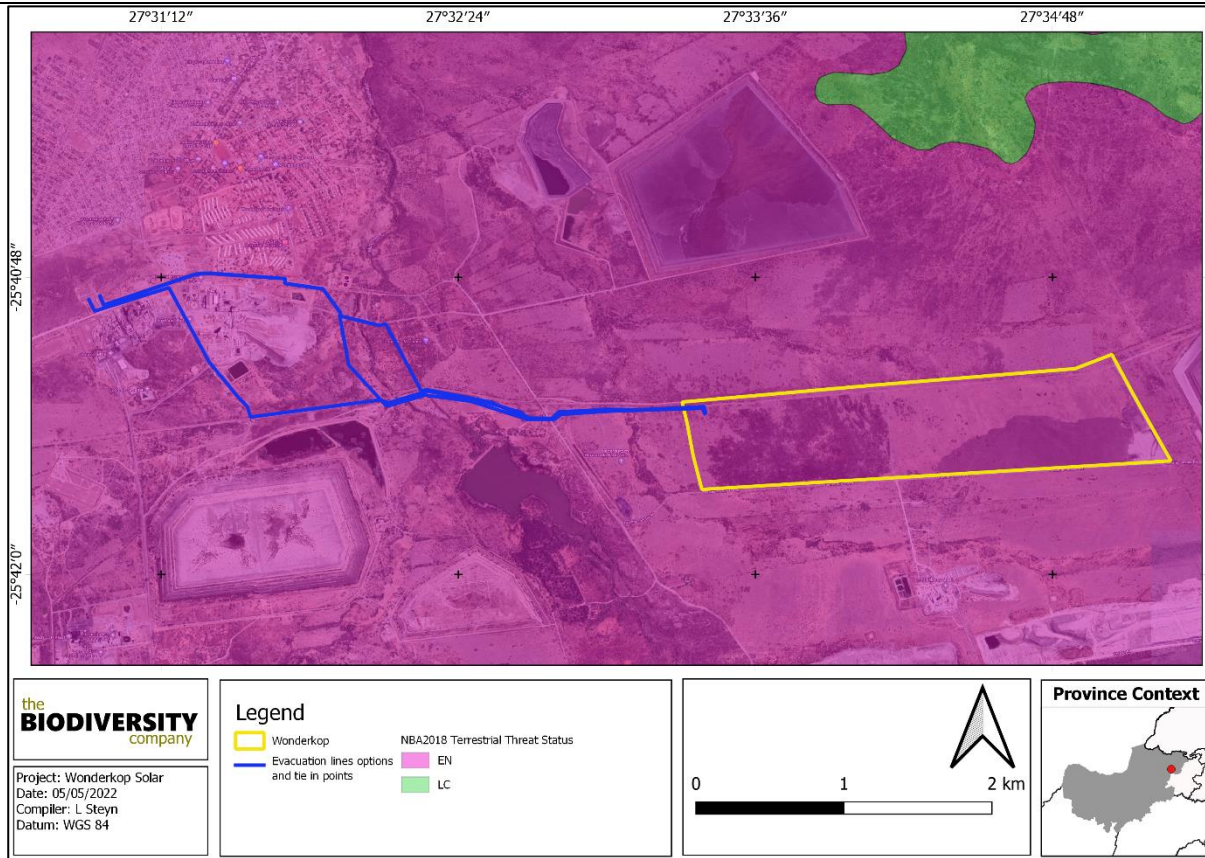
Impacts associated with the construction, operation and decommissioning phases of the proposed PV facility and associated infrastructure on ecology include the following:

- » Biodiversity loss/disturbance
- » Destruction, fragmentation and degradation of habitats and ecosystems
- » Spread and/or establishment of alien and/or invasive species
- » Direct mortality of fauna
- » Reduced dispersal/migration of fauna
- » Environmental pollution due to water runoff, spills from vehicles and erosion
- » Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, heat radiation and light pollution.
- » Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals

#### Sensitivity Analysis of the Site

Based on the desktop assessment it can be said that the project area is somewhat sensitive with a moderate-high likelihood of species of conservation concern occurring. This assumption is based on the EN Ecosystem, NPAES (priority focus area), Magaliesberg IBA and Magaliesberg Biosphere Reserve found in and around the project area.

The expectant anthropogenic activities are likely to drive habitat destruction causing displacement of fauna and flora and possibly event direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area. A map of habitat sensitivity on site is provided in Figure 7.1, with the development area for the MARIKANA Solar PV, indicated in a yellow block. This shows main habitat sensitivity classes on site (note that no CBAs falls within the development area for the MARIKANA Solar PV).



**Figure 7.1.** Preliminary ecological sensitivity map of the combined study area.

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Destruction, fragmentation and degradation of habitats and ecosystems	Direct impacts: Disturbance / degradation / loss to vegetation and habitats Ecological corridors are disrupted Habitat fragmentation Indirect impacts:	Local	Water resources and buffer area

	<p>Erosion risk increases Fire risk increases Increase in invasive alien species</p>		
<p>Spread and/or establishment of alien and/or invasive species</p>	<p>Direct impacts: Loss of vegetation and habitat due to increase in alien species Indirect impacts: Creation of infrastructure suitable for breeding activities of alien and/or invasive species Spreading of potentially dangerous diseases due to invasive and pest species</p>	<p>Regional</p>	<p>None identified at this stage</p>
<p>Direct mortality of fauna</p>	<p>Direct impacts: Loss of SCC species Loss of fauna diversity Indirect impacts: Loss of diversity and species composition in the area. Possible impact on the food chain</p>	<p>Regional</p>	<p>None identified at this stage</p>
<p>Reduced dispersal/migration of fauna</p>	<p>Direct impacts: Loss of genetic diversity Isolation of species and groups leading to inbreeding Indirect impacts: Reduced seed dispersal Loss of ecosystem services</p>	<p>Regional</p>	<p>None identified at this stage</p>
<p>Environmental pollution due to water runoff, spills from vehicles and erosion</p>	<p>Direct impacts: Pollution in watercourses and the surrounding environment Faunal mortality (direct and indirectly) Indirect impacts: Ground water pollution Loss of ecosystem services</p>	<p>Regional</p>	<p>None identified at this stage</p>
<p>Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, heat radiation and light pollution.</p>	<p>Direct impacts: Disruption/alteration of ecological life cycles due to noise Reduced pollination and growth of vegetation due to dust</p>	<p>Regional</p>	<p>None identified at this stage</p>

	<p>Faunal mortality due to light pollution (nocturnal species becoming more visible to predators) Heat radiation could lead to the displacement of species Indirect impacts: Loss of ecosystem services</p>		
Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals	<p>Direct impacts: Loss of SCCs or TOPS species Indirect impacts: Loss of ecosystem service Loss of genetic diversity</p>	Local	None identified at this stage

**Description of expected significance of impact**

The development of the area could result in the loss or degradation of the habitat and vegetation, most of which is still in a natural condition and supports a number of fauna species. The construction of the solar facility could also lead to the displacement/mortalities of the fauna and more specifically SCC fauna species. The operation of the facility could result in the disruption of ecological life cycles. This could be as a result of a number of things, but mainly due to dust, noise, light pollution, and heat radiation. The disturbance of the soil/vegetation layer will allow for the establishment of flora alien invasive species, the new infrastructure in turn will provide refuge for invasive/feral fauna species. Erosion is another possible impact that could result from the disturbance of the top soil and vegetation cover. A number of machines, vehicles and equipment will be required, aided by chemicals and concrete mixes for the project. Leaks, spillages, or breakages from any of these could result in contamination of the receiving water resources. Contaminated water resources are likely to have an effect on the associated biota.

**Gaps in knowledge & recommendations for further study**

- » This study is completed at a desktop level only.
- » Identification and descriptions of habitats.
- » Identification of the Site Ecological Importance.
- » Location and identification of SCCs as well as in the case of fauna their location of the nests/dens.
- » Determine a suitable buffer width for the identified features.

**Recommendations with regards to general field surveys**

- » Field surveys to prioritise the development areas, but also consider the 500 m PAOI.
- » Fieldwork to be undertaken during the wet season period.
- » Avifauna assessment field work to be conducted over two seasons to ensure migratory species are considered.

### 8.2.2. Impacts on avifauna

In summary, the main impacts of PV plants on avifauna which have been identified to date include the following:

#### **Displacement due to disturbance associated with the construction of the solar PV plant and associated infrastructure**

- » As far as disturbance is concerned, it is likely that all the avifauna, including all the priority species (these are species that are of concern due to their population status and their sensitivity to habitat manipulation), will be temporarily displaced in the footprint area, either completely or more likely partially (reduced densities) during the construction phase, due to the disturbance associated with the construction activities e.g. increased vehicle traffic and short-term construction related noise (from equipment) and visual disturbance

#### **Displacement due to habitat transformation associated with the construction of the solar PV plant and associated infrastructure**

- » Ground-disturbing activities affect a variety of processes in arid areas, including soil density, water infiltration rate, vulnerability to erosion, secondary plant succession, invasion by exotic plant species, and stability of cryptobiotic soil crusts. These processes have the ability – individually and together – to alter habitat quality, often to the detriment of wildlife, including avifauna. Any disturbance and alteration to the desert landscape, including the construction and decommissioning of utility-scale solar energy facilities, has the potential to increase soil erosion. Erosion can physically and physiologically affect plant species and can thus adversely influence primary production and food availability for wildlife (Lovich & Ennen 2011).

#### **Collisions with the solar panels**

- » This impact refers to collision-related fatality during operation i.e., fatality resulting from the direct contact of the bird with a project structure(s). This type of fatality has been occasionally documented at solar projects of all technology types (McCrary et al. 1986; Hernandez et al. 2014; Kagan et al. 2014). In some instances, the bird is not killed outright by the collision impact, but succumbs to predation later, as it cannot avoid predators due to its injured state.

#### **Entrapment in perimeter fences**

- » Visser et al. (2018) recorded a fence-line fatality (Orange River Francolin *Scleroptila gutturalis*) resulting from the bird being trapped between the inner and outer perimeter fence of the facility. This was further supported by observations of large-bodied birds unable to escape from between the two fences (e.g., Red-crested Korhaan (*Lophotis ruficrista*) (Visser et al. 2019). Considering that one would expect the birds to be able to take off in the lengthwise direction (parallel to the fences), it seems possible that the birds panicked when they were approached by observers and thus flew into the fence.

#### **Electrocution of priority species on the internal medium voltage reticulation network**

- » Medium voltage electricity poles could potentially pose an electrocution risk to raptors. Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (van Rooyen 2000). The electrocution risk is largely determined by the design of the electrical hardware.

**Collision with the internal medium voltage overhead lines**

- » Collisions are the biggest threat posed by transmission lines to birds in southern Africa (Van Rooyen 2004). Most heavily impacted upon are bustards, storks, cranes, and various species of waterbirds, and to a lesser extent, vultures. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with transmission lines (Van Rooyen 2004, Anderson 2001).

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Destruction, fragmentation and degradation of habitats and ecosystems	Direct impacts: Disturbance / degradation / loss to vegetation and habitats Ecological corridors are disrupted Habitat fragmentation Indirect impacts: Erosion risk increases Fire risk increases Increase in invasive alien species	Local	Water resources and buffer area
Direct mortality of avifauna	Direct impacts: Loss of SCC species Loss of avifauna diversity Indirect impacts: Loss of diversity and species composition in the area. Possible impact on the food chain	Regional	None identified at this stage
Reduced dispersal/migration of avifauna	Direct impacts: Loss of genetic diversity Isolation of species and groups leading to inbreeding Indirect impacts: Reduced seed dispersal Loss of ecosystem services	Regional	None identified at this stage
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, heat radiation and light pollution.	Direct impacts: Disruption/alteration of ecological life cycles due to noise Reduced pollination and growth of vegetation due to dust	Regional	None identified at this stage

Avifaunal mortality due to light pollution (nocturnal species becoming more visible to predators)  
Heat radiation could lead to the displacement of species  
Indirect impacts:  
Loss of ecosystem services

#### **Description of expected significance of impact**

The development of the area could result in the loss or degradation of the habitat and vegetation, most of which is still in a natural condition and supports a number of avifauna species. The construction of the solar facility could also lead to the displacement/mortalities of the avifauna and more specifically SCC avifauna species. The operation of the facility could result in the disruption of ecological life cycles. This could be as a result of a number of things, but mainly due to dust, noise, light pollution, and heat radiation. Leaks, spillages, or breakages from any of these could result in contamination of the receiving water resources. Contaminated water resources are likely to have an effect on the associated biota.

#### **Gaps in knowledge & recommendations for further study**

- » This study is completed at a desktop level only.
- » Identification and descriptions of habitats.
- » Identification of the Site Ecological Importance.
- » Location and identification of SCCs as well as in the case of fauna their location of the nests/dens.
- » Determine a suitable buffer width for the identified features.

Recommendations with regards to general field surveys

- » Field surveys to prioritise the development areas, but also consider the 500 m PAOI.
- » Fieldwork to be undertaken during the wet season period.
- » Avifauna assessment field work to be conducted over two seasons to ensure migratory species are considered.

### **8.2.3. Impacts on Freshwater Features**

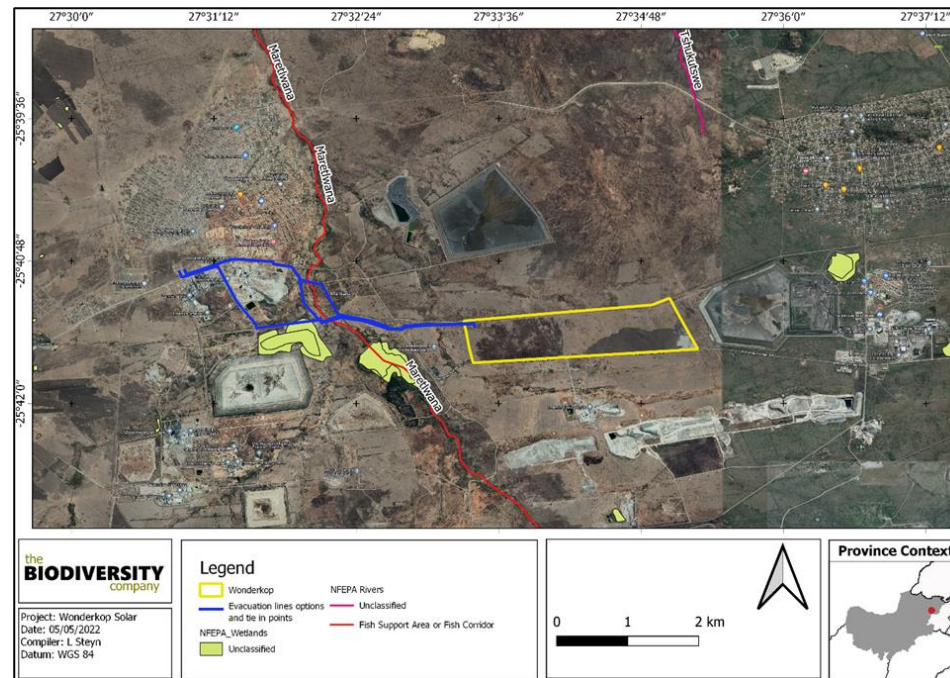
#### **Impacts on Freshwater features**

A key consideration for the scoping level impact assessment is the presence of the water resources delineated in proximity to the project area. The available data suggests the presence of drainage features and wetlands. These systems are characterised by soils with hydromorphic properties. The overall sensitivity of these systems is expected to be high. A Zone of Regulation (ZoR) of 32 m is expected for a drainage line according to NEMA (Act No. 107 of 1998). A 500 m ZoR is applicable for any wetland system.

#### **Sensitivity Analysis of the Site**

A key consideration for the impact assessment is the presence of the identified water resources in relation to the project area. The available data also suggests the presence of drainage features in the area, with wetlands system expected for the 500 m regulation area. Construction could result in the encroachment into water resources and result in the loss or degradation of these system, most of which are functional and provide ecological services. These disturbances could also result in the infestation and establishment of alien vegetation would affect the functioning of the systems. Leaks and/or spillages could result in contamination of the receiving water resources. Contaminated water resources are likely to have an effect on the associated biota. An increase in stormwater runoff could result in physical changes to the receiving systems caused by erosion, run-off and also sedimentation, and the functional changes could result in changes to the vegetative structure of the systems

The aquatic biodiversity theme sensitivity defined by the DFFE online screening tool indicates predominantly areas of “Very High” sensitivity (**Figure 7.3**) aligned with the Ecological Support Areas and watercourses. These “Very High” sensitivities are attributed to the presence of wetlands, rivers, and priority area Quaternary catchments. The watercourses in the area are classified as Least Threatened and the floodplain systems are classified as Critically Endangered. Further to this, also considering the presence of areas indicated as Ecological Support Areas, a buffer width of 45m is recommended for construction and operation activities.



**Figure 7.3:** The aquatic biodiversity theme sensitivity for MARIKANA PV facility



Issue	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance / degradation / loss to wetland soils or vegetation due to the construction of the facility and associated infrastructure, such as crossings	Direct impacts: Disturbance / degradation / loss to wetland soils or vegetation Indirect impacts: Loss of ecosystem services	Regional	Water resources and buffer area
Increased erosion and sedimentation & contamination of resources	Direct impacts: Erosion and structural changes to the systems Indirect impacts: Sedimentation & contamination of downstream reaches	Regional	None identified at this stage

#### Description of expected significance of impact

The development of the area could result in the encroachment into water resources and result in the loss or degradation of these system, most of which are functional and provide ecological services. Water resources are also likely to be traversed by roads and other linear infrastructure which might create a barrier to flow and biotic movement across the systems. These disturbances could also result in the infestation and establishment of alien vegetation would affect the functioning of the systems. Earthworks will expose and mobilise earth materials which could result in sedimentation of the receiving systems. A number of machines, vehicles and equipment will be required, aided by chemicals and concrete mixes for the project. Leaks, spillages, or breakages from any of these could result in contamination of the receiving water resources. Contaminated water resources are likely to influence the associated biota. It is anticipated to increase stormwater runoff due to the hardened surfaces and the crossings will result in an increase in run-off volume and velocities, resulted in altered flow regimes. The changes could result in physical changes to the receiving systems caused by erosion, run-off and also sedimentation, and the functional changes could result in changes to the vegetative structure of the systems. The reporting of surface run-off to the systems could also result in the contamination of the systems, transporting (in addition to sediment) diesel, hydrocarbons, and soil from the operational areas.

#### Gaps in knowledge & recommendations for further study

- » This study is completed at a desktop level only.
- » Identification, delineation, and characterisation of water resources.
- » Undertake a functional assessment of systems where applicable.
- » Determine a suitable buffer width for the resources.

#### Recommendations with regards to general field surveys

- » Field surveys to prioritise the development areas, but also consider the 500 m regulation area.
- » Beneficial to undertake fieldwork during the wet season period.

### 8.2.4. Impacts on Soils, Geology, Agricultural Potential

Potential impacts associated with the project include the loss of land capability and loss of soil resources due to erosion. Considering the occurrence of various soil forms that are commonly associated with high land capabilities, it is unlikely that areas with high land capability sensitivity do occur within the project area. Further to this, due to the climatic capability, the ultimate land potential is more likely to be low.

#### Sensitivity Analysis of the Site

Considering the occurrence of various soil forms that are commonly associated with high land capabilities, it is unlikely that areas with high land capability sensitivity do occur within the project area. Further to this, due to the climatic capability, the ultimate land potential is more likely to be low.

(Figure 7.4). This sensitivity is based on the screening tool and considered to be preliminary for this stage of the project. These sensitivities will be confirmed during the impact phase of the project.

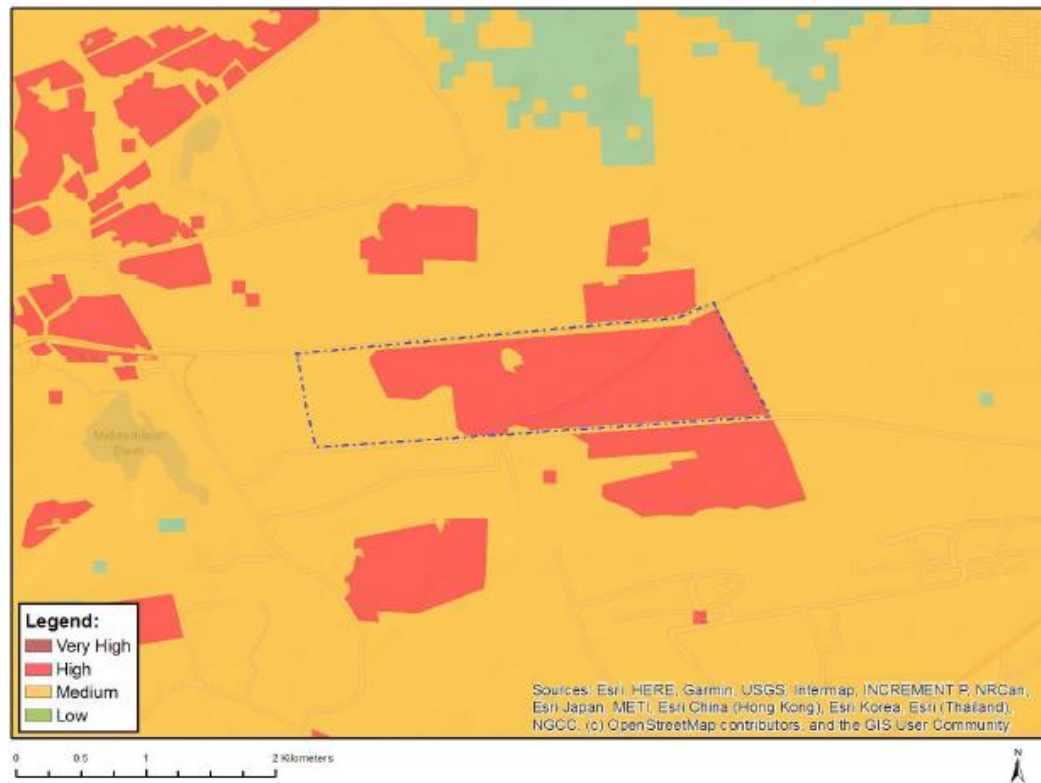


Figure 7.4: The agriculture theme sensitivity

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Compaction/soil stripping/transformation of land use which leads to loss of land capability	Direct impacts: Loss of soil / land capability  Indirect impacts: Loss of land capability	Regional	None identified at this stage
<p><b>Description of expected significance of impact</b></p> <p>The development of the area could result in the encroachment into areas characterised by high land potential properties, which can ultimately result in the loss of land capability. These disturbances could also result in the infestation and establishment of alien vegetation, which in turn can have a detrimental impact on soil resources. Earthworks will expose and mobilise earth materials which could result in compaction and/or erosion. A number of machines, vehicles and equipment will be required, aided by chemicals and concrete mixes for the project. Leaks, spillages, or breakages from any of these could result in contamination of soil resources, which could affect the salinity or pH of the soil, which can render the fertility of the soil unable to provide nutrition to plants. During the operational phase, the impacts associated with the substation and collector sub will be easily managed by best “housekeeping” practices.</p> <p><b>Gaps in knowledge &amp; recommendations for further study</b></p> <ul style="list-style-type: none"> <li>» This study is completed at a desktop level only.</li> <li>» Identification and delineation of soil forms.</li> <li>» Determine of soil sensitivity.</li> </ul> <p><b>Recommendations with regards to general field surveys</b></p> <ul style="list-style-type: none"> <li>» Field surveys to prioritise the development areas.</li> </ul>			

### 8.2.5. Impacts on Heritage (Archaeology)

<p><b>Heritage (archaeological and palaeontological resources)</b></p> <p><b>Archaeology</b></p> <p>The Phase I HIA study for the proposed marikana Solar PV Facility Project revealed none of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999).</p> <p>There is consequently no reason from a heritage point of view why the proposed marikana Solar PV Facility Project could not proceed. However, chance-find procedures for both heritage resources and graves are recommended and are fully outlined in the report.</p> <p>As a result of the absence of any heritage resources in the project area no significance rating for any heritage resources or for the possible impact of the marikana PV Solar Facility Project on any heritage resources was undertaken.</p> <p><b>Chance-find procedures for heritage resources</b></p>
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The initial procedure to follow whenever heritage resources are uncovered during development is aimed at avoiding any further possible damage to the heritage resources, namely:

- » The person or group (identifier) who identified or exposed the heritage resource or graves must cease all activity in the immediate vicinity of the site.
- » The identifier must immediately inform the senior on-site manager of the discovery.
- » The senior on-site manager must make an initial assessment of the extent of the find and confirm that further work has stopped and ensure that the site is secured, and that controlled access is implemented.
- » The senior on-site manager will inform the Environmental Officer (EO) and Health and Safety (HS) officers of the chance-find and its immediate impact on the Project. The EO will then contact the project archaeologist.
- » The project archaeologist will do a site inspection and confirm the significance of the discovery, recommend appropriate mitigation measures to the mine, and notify the relevant authorities.
- » Based on the comments received from the authorities the project archaeologist will provide the mine with a Terms of References Report and associated costs if mitigation measures must be implemented.

#### **Chance-find Procedures for graves**

If previously unidentified graves are uncovered and/or exposed during any of the developmental phases of the marikana Solar PV Facility Project, the following steps must be implemented after those outlined above:

- » The project archaeologist must confirm the presence of graveyards and graves and follow the following procedures.
- » Inform the local South African Police Service (SAPS) and traditional authority.
- » The project archaeologist in conjunction with the SAPS and traditional authority will inspect the possible graves and make an informed decision whether the remains are of forensic, recent, cultural-historical or of archaeological significance.
- » Should it be concluded that the find is of heritage significance and therefore protected in terms of heritage legislation the project archaeologist will notify the relevant authorities.
- » The project archaeologist will provide advice about mitigation measures for the graveyards and graves.

### 8.2.6. Social Impacts

The construction phase of the PV SEF will extend over a period of 12-18 months and create in the region of 200 employment opportunities. Members from the local communities in the area, specifically Rustenburg and the adjacent residential areas, would be able to qualify for most of the low skilled and semi-skilled employment opportunities. Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members of the community. Based on information from similar projects the total wage bill will be in the region of R 25 million (2021 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area.

Given high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localized, social benefit. The capital expenditure associated with the construction phase will be R 1 billion (2022 Rand value). Given the well-developed mining sector the potential for local companies (engineering, civils etc.) in the RLM to benefit from the project is high. The local service sector will also benefit from the construction phase. The potential opportunities would be linked to accommodation, catering, cleaning, transport, and security, etc. associated with the construction workers on the site.

The hospitality industry in the area will also benefit from the provision of accommodation and meals for professionals (engineers, quantity surveyors, project managers, product representatives etc.) and other (non-construction) personnel involved on the project. Experience from other construction projects indicates that the potential opportunities are not limited to on-site construction workers but also to consultants and product representatives associated with the project.

The positive and negative social impacts identified and assessed for the construction phase includes:

- » Direct and indirect employment opportunities
- » Economic multiplier effects
- » Influx of jobseekers and change in population
- » Safety and security impacts
- » Impacts on daily living and movement patterns
- » Nuisance impacts, including noise and dust
- » Visual impacts and sense of place impacts

Nature: The establishment of several renewable energy facilities and associated projects, such as the proposed SEF, in the RLM has the potential to place pressure on local services, specifically medical, education and accommodation

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Cumulative impact on local services, including accommodation, medical and emergency services	<u>Direct impacts:</u> » Pressure on available services (medial, emergency etc.)	Local-Regional	N/A

	<ul style="list-style-type: none"> <li>» Pressure on available accommodation.</li> </ul> <p><u>Indirect impacts:</u></p> <ul style="list-style-type: none"> <li>» Potential impact on rentals and cost of services.</li> </ul>		
<p><b>Description of expected significance of impact</b></p> <p>The establishment of renewable energy projects do have the potential to have a cumulative impact on local services, specifically accommodation and emergency services. The significance will depend on the number of REFs proposed and timing of construction.</p>			
<p><b>Gaps in knowledge &amp; recommendations for further study</b></p> <ul style="list-style-type: none"> <li>» Collection of information on number REFs proposed and timing of construction phase.</li> </ul> <p><b>Recommendations with regards to general field surveys</b></p> <ul style="list-style-type: none"> <li>» Site visit and interviews with local municipal officials and representatives from hospitality associations etc.</li> </ul>			

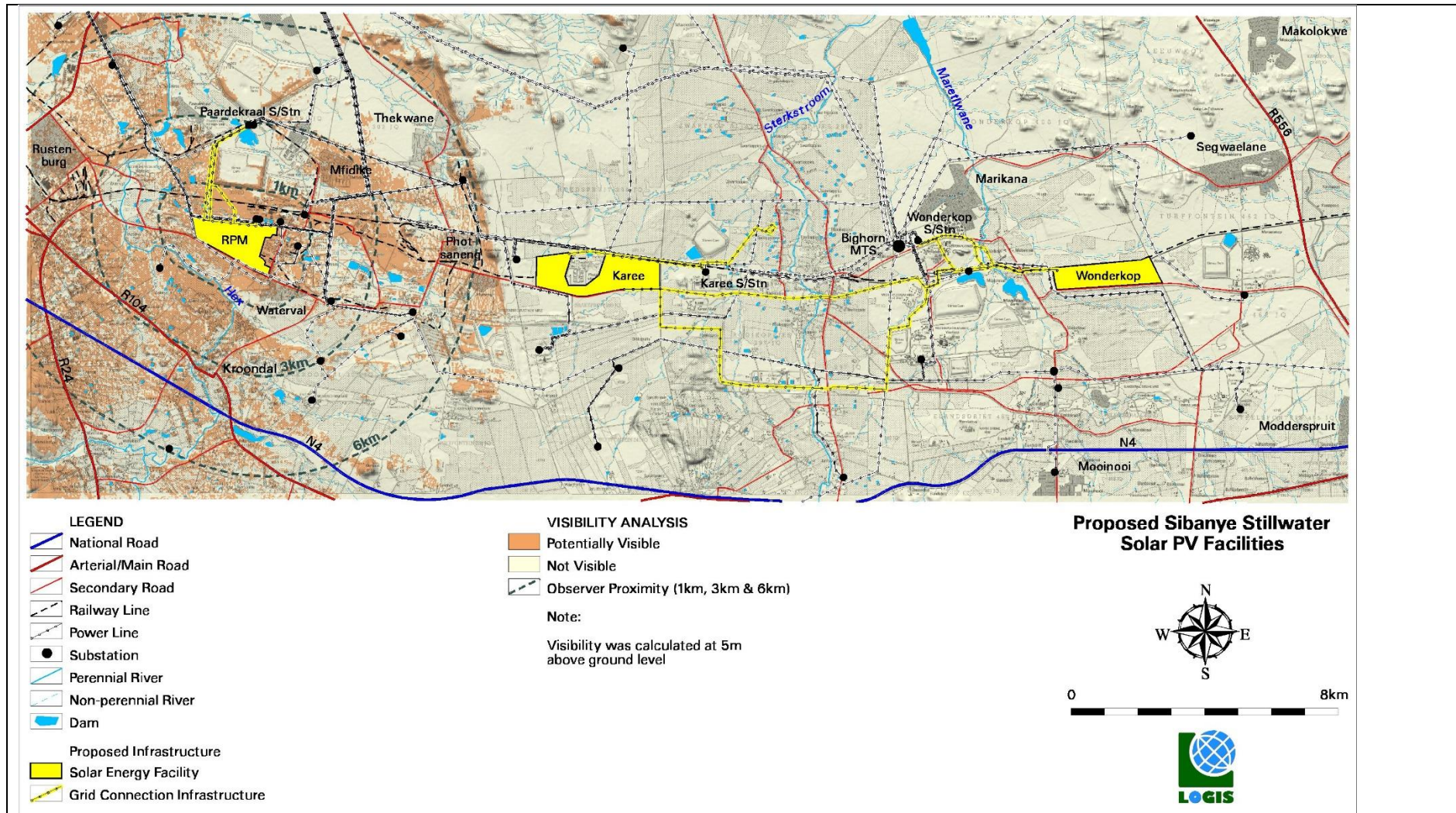
<p><b>Nature: The establishment of renewable energy facilities and associated projects, such as the SEF, in the ULM will create employment, skills development and training opportunities, creation of downstream business opportunities.</b></p>			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Cumulative benefits in terms of creating employment, business, and skills development opportunities for the local municipality	<p><u>Direct impacts:</u></p> <ul style="list-style-type: none"> <li>» Creation of employment, business, and skills development opportunities for the local municipality</li> </ul> <p><u>Indirect impacts:</u></p> <ul style="list-style-type: none"> <li>» Support local economic development.</li> </ul>	Local-Regional	N/A
<p><b>Description of expected significance of impact</b></p> <p>The establishment of renewable energy projects do have the potential to create benefits in terms of creating employment, business, and skills development opportunities for the local municipality. The significance will depend on the number of REFs proposed and timing of construction.</p>			
<p><b>Gaps in knowledge &amp; recommendations for further study</b></p> <ul style="list-style-type: none"> <li>» Collection of information on number REFs proposed and timing of construction phase.</li> </ul> <p><b>Recommendations with regards to general field surveys</b></p> <ul style="list-style-type: none"> <li>» Site visit and interviews with local municipal officials and representatives from hospitality associations etc.</li> </ul>			

<p><b>Nature: The no-development option would result in the lost opportunity for South Africa to improve energy security and assist to support with the development of clean, renewable energy.</b></p>			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Lost opportunity to improve energy security and develop clean, renewable energy	<p><u>Direct impacts:</u></p> <ul style="list-style-type: none"> <li>» Energy security</li> </ul>	Local-Regional	N/A

	» Creation of employment, business, and skills development opportunities for the local municipality <u>Indirect impacts:</u> » Address climate change.		
<p><b>Description of expected significance of impact</b>                  The establishment of renewable energy projects will improve energy security and create benefits in terms of creating employment, business, and skills development opportunities. These benefits would be foregone if the REF is not developed.</p>			
<p><b>Gaps in knowledge &amp; recommendations for further study</b>                  » Collection and review of information on REIPPPP.  <b>Recommendations with regards to general field surveys</b>                  » N/A. Desktop review of REIPPPP.</p>			

**8.2.7. Visual Impact**

In general terms it is envisaged that the structures, where visible from shorter distances (e.g., less than 1km and potentially up to 3km), and where sensitive visual receptors may find themselves within this zone, may constitute a high visual prominence, potentially resulting in a visual impact. This may include the residents of the farm dwelling (Waterval), as well as observers travelling along 1<sup>st</sup> Street south of the facility.



**Figure 7.5:** The Visual landscape of the site

The following is evident from the viewshed analyses:

**0 – 1km**



The PV facility may be highly visible within a 1km radius of the proposed development. This zone predominantly falls within mining land, with only one homestead (Waterval) located 1km to the west of the site (adjacent to the Hex River). The Waterval residential area is located to the south-east of the site, and visual exposure to the PV facility from the northern outlying parts of this town may be possible. The PV facility is also expected to be highly visible from the road (1<sup>st</sup> Street) traversing immediately south of the PV site.

### **1 – 3km**

Within this zone the visual exposure will predominantly be to the north-east and the south-west. Most of the exposure to the north-east will be within mining land, but it does include the Mfidike residential area. Visual exposure is however unlikely due to the built-up nature of the town. Visual exposure to the south-west may include the Waterkloof Township and a number of smallholdings south of the Hex River. The likelihood of visual exposure to the project infrastructure is however expected to be low, due to the built-up nature of these areas, and the presence of woodland and planted vegetation cover.

The proposed PV facility may also be visible from the R104 arterial road at a distance of just under 3km. This visual exposure will be in transit and is likely to be relatively brief.

### **3 - 6km**

Within a 3 – 6km radius, the visual exposure is more scattered and interrupted due to the undulating nature of the topography. Most of the visual exposure will be within developed (built-up) land, making the likelihood of visual exposure improbable. This zone includes the most eastern residential area of Rustenburg and the Rustenburg Airfield.

Visual exposure to the east will fall mainly within mining land, with a great deal of mining, railway line and electricity distribution infrastructure present in this area. Visual exposure from the western outlying parts of the Photsaneng residential area may theoretically be possible, but it is unlikely due to the presence of existing visual clutter and built structures at this locality.

### **> 6km**

At distances exceeding 6km the intensity of visual exposure is expected to be very low and highly unlikely due to the distance between the object (PV facility) and the observer, and the developed nature of the study area.

Anticipated issues related to the potential visual impact of the proposed PV facility include the following:

- » The visibility of the facility to, and potential visual impact on, observers travelling along the secondary road (1st Street) in closer proximity to the proposed infrastructure.
- » The visibility of the facility to, and potential visual impact on residents of dwellings within the study area, with specific reference to the farm residence in closer proximity to the proposed development.
- » The potential visual impact of the facility on the visual character or sense of place of the region.

- » The potential visual impact of the facility on tourist routes or tourist destinations/facilities (if present).
- » The potential visual impact of the construction of ancillary infrastructure (i.e., internal access roads, buildings, power line, etc.) on observers in close proximity to the facility.
- » The visual absorption capacity of the natural vegetation (if applicable) or built structures/mining infrastructure.
- » Potential cumulative visual impacts (or consolidation of visual impacts), with specific reference to the placement of the PV facility within a predominantly mining area.
- » The potential visual impact of operational, safety and security lighting of the facility at night on observers residing in close proximity of the facility.
- » Potential visual impact of solar glint and glare as a visual distraction and possible air/road travel hazard.
- » Potential visual impact of solar glint and glare on static ground-based receptors (residents of homesteads) in close proximity to the PV facility.
- » Potential visual impacts associated with the construction phase.
- » The potential to mitigate visual impacts and inform the design process.

It is envisaged that the issues listed above may potentially constitute a visual impact at a local and/or regional scale. These need to be assessed in greater detail during the EIA phase of the project.

Impact

Visual impact of the facility on observers in close proximity to the proposed PV facility infrastructure and activities. Potential sensitive visual receptors include:

- Residents of homesteads and farm dwellings (in closer proximity to the facility)
- Observers travelling along the secondary roads traversing near the proposed development

Issue	Nature of Impact	Extent of Impact	No-Go Areas
The viewing of the PV facility infrastructure and activities	The potential negative experience of viewing the infrastructure and activities	Primarily observers situated within a 1 km (and potentially up to 3km) radius of the facility	N.A.

**Description of expected significance of impact**

- » Extent: Local
- » Duration: Long term
- » Magnitude: Moderate
- » Probability: Probable
- » Significance: Moderate
- » Status (positive, neutral or negative): Negative
- » Reversibility: Recoverable
- » Irreplaceable loss of resources: No

<p>» Can impacts be mitigated: Yes</p> <p><b>Gaps in knowledge &amp; recommendations for further study</b></p> <p>A finalised layout of the PV facility and ancillary infrastructure are required for further analysis. This includes the provision of the dimensions of the proposed structures and ancillary equipment.</p> <p>Additional spatial analyses are required in order to create a visual impact index that will include the following criteria:</p> <ul style="list-style-type: none"> <li>» Visual exposure</li> <li>» Visual distance/observer proximity to the structures/activities</li> <li>» Viewer incidence/viewer perception (sensitive visual receptors)</li> <li>» Visual absorption capacity of the environment surrounding the infrastructure and activities</li> </ul> <p>Additional activities:</p> <ul style="list-style-type: none"> <li>» Identify potential cumulative visual impacts</li> <li>» Undertake a site visit</li> <li>» Recommend mitigation measures and/or infrastructure placement alternatives</li> </ul>
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### 8.2.8. Traffic Impact

The potential impacts to the surrounding environment expected to be generated from the development traffic is traffic congestion and associated noise, dust, and exhaust pollution. This will be true for the construction, operation, and decommissioning phase. It must be noted that a Traffic Impact Assessment is aimed at assessing impacts of the traffic volume generated by the site on the surrounding road network capacity, as such, it is not intended to assess the environmental impacts associated with traffic generation/congestion. Although traffic generation has an environmental impact, the assessment of these environmental impacts as presented in this report are only indicative. This assessment of the environmental impacts is aimed at providing input for the EIA process.

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Noise caused by increase in traffic	<p><u>Direct impacts:</u></p> <ul style="list-style-type: none"> <li>» Increased road user stress levels and reduced alertness.</li> <li>» Potential hearing impairment of road users.</li> <li>» Masking of warning sounds such as car horns.</li> </ul> <p><u>Indirect impacts:</u></p> <ul style="list-style-type: none"> <li>» Potential increase in accident rates.</li> </ul>	local	None identified at this stage

Dust caused by <del>road</del> increase in traffic	<u>Direct impacts:</u> <ul style="list-style-type: none"> <li>» Impacts on the health of road users</li> <li>» Reduced visibility for road users in the vicinity of the site due to airborne dust.</li> <li>» Reduced visibility of road signs and road markings due to dust covering transport routes and facilities.</li> </ul> <u>Indirect impacts:</u> <ul style="list-style-type: none"> <li>» Potential increase in accident rates.</li> </ul>	local	None identified at this stage
Exhaust emissions caused by increase in traffic	<u>Direct impacts:</u> <ul style="list-style-type: none"> <li>» Impacts on the health of road users</li> <li>» Reduced visibility for road users'</li> </ul> <u>Indirect impacts:</u> <ul style="list-style-type: none"> <li>» Acid rain and smog production which can reduce road safety due to poor road visibility and deterioration of road furniture</li> </ul>	local	None identified at this stage

### 7.3. Evaluation of Potential Cumulative Impacts Associated with the project

Impacts of a cumulative nature place the direct and indirect impacts of the proposed project into a regional and national context, particularly in view of similar or resultant developments and activities in the region. Potential cumulative impacts associated with the marikanaPV facility are described below and will be assessed in detail as part of the EIA phase to be conducted for the project.

Cumulative impacts, in relation to an activity, refer to the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area. For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited to effects that can be evaluated meaningfully (DEAT, 2004). It is important to explore the potential for cumulative impacts as this will lead to a better understanding of these impacts and the potential for mitigation that may be required. The scale at which the cumulative impacts are assessed is important. For example, the significance of the cumulative impact on the regional or national economy will be influenced by solar PV facility developments throughout South Africa, while the significance of the cumulative impact on the visual amenity may only be influenced by solar PV facility developments that are in closer proximity to each other. For practical purposes a sub-regional scale of 30km is considered for the evaluation of cumulative impact of PV facilities.

The cumulative impacts associated with marikana PV have been viewed from two perspectives within this Scoping Report:

- » Cumulative impacts associated with the scale of the project (one 30MW PV Facility on the project site); and
- » Cumulative impacts associated with other relevant planned, approved, or existing solar developments within a 30km radius of the project site (multiple PV facilities in the proximity of the site).

Cumulative effects are commonly understood as the impacts which combine from different projects, and which result in significant change, which is larger than the sum of all the impacts (DEAT, 2004). The complicating factor is that the projects that need to be considered are from past, present, and reasonably foreseeable future development. Cumulative effects can be characterised according to the pathway they follow. One pathway could be the persistent additions from one process. Another pathway could be the compounding effect from one or more processes. Cumulative effects can therefore occur when impacts are:

- » Additive (incremental).
- » Interactive.
- » Sequential; or
- » Synergistic.

Canter and Sadler (1997) describe the following process for addressing cumulative effects in an EIA:

- » Delineating potential sources of cumulative change (i.e., GIS to map the relevant renewable energy facilities in close proximity to one another).
- » Identifying the pathways of possible change (direct impacts).
- » Indirect, non-linear, or synergistic processes; and
- » Classification of resultant cumulative changes.

The site for the proposed development is located within 30km from several other authorised solar PV facilities. These projects include the following (refer to **Figure 7.6**):

Project Name	Project Status
Construction of the RUSTMO1 PV Plant	Authorized
Lonmin Western Platinum Limited PV Plant	In Progress
Avelar Solar Panel Project for International Ferro Metals	Authorized
Proposed Construction of the RUSTMO3 PV Plant	In Process
Proposed Construction of the RUSTMO4 PV Plant	In Process
Expansion of the co-generation plant, including oil tanks	Authorized
Construction of the RUSTMO2 Pv Plant	Authorized

The cumulative impacts that have the potential to be compounded through the development of the solar PV facility and its associated infrastructure in proximity to other similar developments include impacts such as those listed below. The role of the cumulative assessment is to test if such impacts are relevant to the marikana PV facility within the development area being considered for the development:

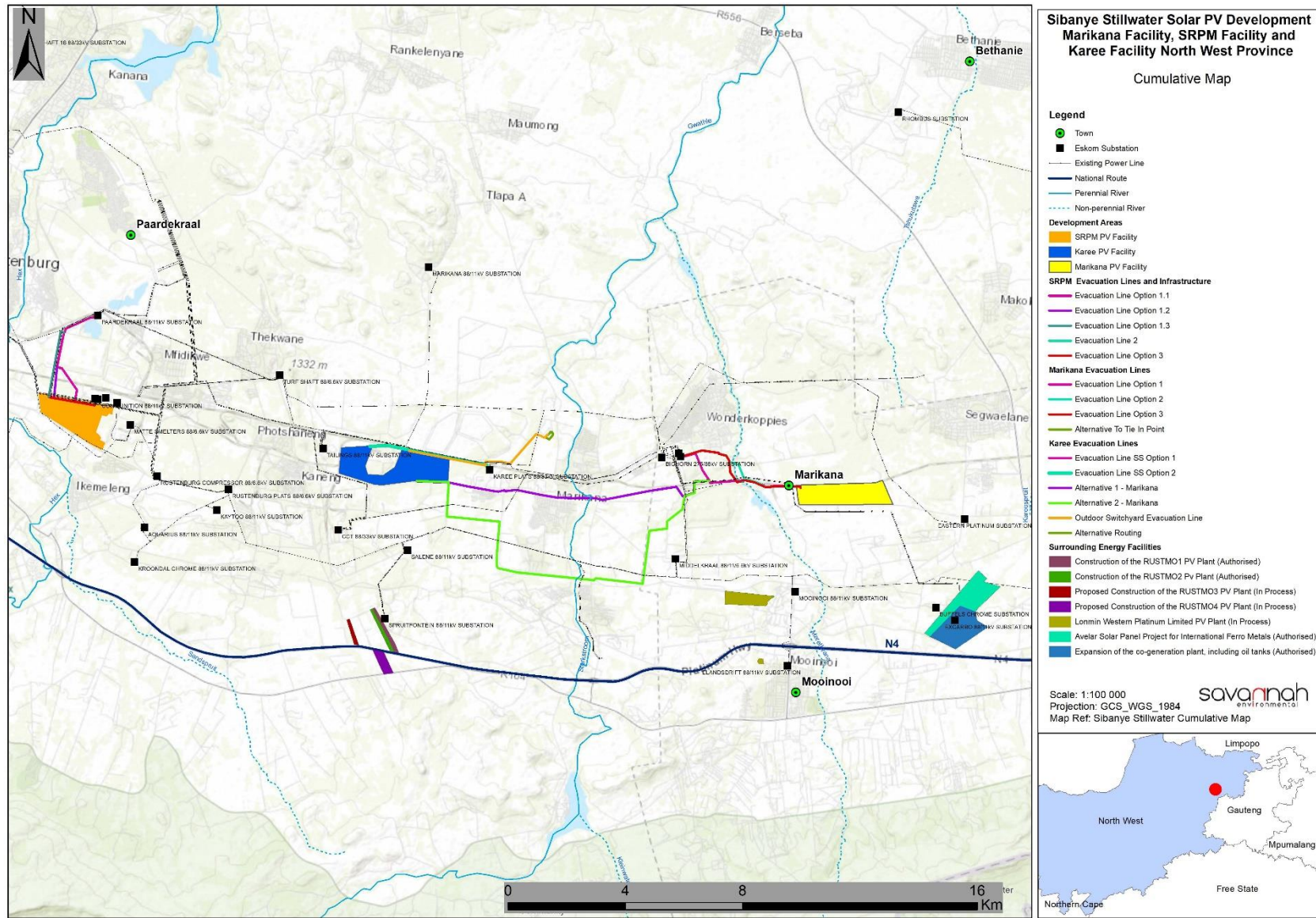
- » Unacceptable loss of threatened or protected vegetation types, habitat, or species through clearing, resulting in an impact on the conservation status of such flora, fauna, or ecological functioning.
- » Unacceptable risk to freshwater features through disturbance associated with construction activities and increased runoff and erosion during the operation phase.
- » Unacceptable risk to avifauna through habitat loss, displacement, and collision with PV panels.
- » Unacceptable loss of high agricultural potential areas presenting a risk to food security and increased soil erosion.
- » Unacceptable loss of heritage resources (including palaeontological and archaeological resources).
- » Unacceptable impact to social factors and components.

**Summary of the nature, significance, consequence, extent, duration, and probability of the impacts**

- » The above-mentioned impacts are considered to be probable, although it is anticipated that the extent, duration, and magnitude of these impacts can be minimised to levels where this impact can be regarded as having low significance through the implementation of appropriate mitigation measures.
- » The operational lifespan of the project and other solar energy facilities within the surrounding areas is expected to be long-term (i.e., a minimum of 20 years) and subsequently the impact is also expected to be long-term.
- » The impact associated with the proposed development is expected to be local, affecting mainly the immediate environment and surrounding areas, as well as other renewable energy facilities within the vicinity.

**Gaps in knowledge & recommendations for further study:**

- » Each specialist study will consider and assess the cumulative impacts of proposed, approved and authorised renewable projects in the area.
- » Cumulative impacts will be fully assessed and considered in the EIA phase.



**Figure 7.5:** Cumulative map illustrating other approved and/or constructed PV facilities located within the vicinity of the MARIKANA Solar PV Facility project site (Appendix I).

## CHAPTER 8 CONCLUSIONS

This Scoping Report is aimed at detailing the nature and extent of the proposed development, identifying and describing potential issues associated with developing the MARIKANA Solar PV Facility and associated infrastructure on the identified site, potential environmental fatal flaws and/or areas of sensitivity, and defining the extent of studies required to be undertaken as part of the detailed EIA phase. This was achieved through an evaluation of the proposed project, involving the project proponent, and specialist consultants. This Scoping Report has been compiled in terms of the 2014 EIA Regulations (GNR 326) published in terms of Section 24(5) of NEMA.

A summary of the conclusions of the evaluation of the potential impacts identified to be associated with the project is provided in **Section 8.2**. Recommendations regarding investigations required to be undertaken within the detailed EIA phase are provided within the Plan of Study for EIA (**Chapter 9**).

### 8.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter of the scoping report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(g)(xi) a concluding statement indicating the preferred alternatives, including the preferred location of the activity.	An overall conclusion and fatal flaw analysis regarding the MARIKANA Solar PV facility is included within this chapter as a whole.

### 8.2. Overview of the MARIKANA Solar PV Facility

This Scoping Report documents the procedure for determining the extent of, and approach to, the Environmental Impact Assessment (EIA) Phase. The Scoping Phase included the following key tasks:

- » Involvement of relevant authorities and Interested and Affected Parties (I&APs) through the Public Involvement Process.
- » Consideration of feasible alternatives to be assessed during the EIA Phase.
- » Identification of potential impacts (positive and negative) associated with feasible project alternatives to be assessed during the EIA Phase.
- » Defining Terms of Reference for any specialist studies required to inform the EIA Phase (Plan of Study (PoS) for the Environmental Impact Assessment Report.

The MARIKANA Solar PV Facility is proposed on a site located approximately 8km east from the town of Marikana. The project falls within the Rustenburg Local Municipality, and within the greater Bonjanala Platinum District Municipality, North West Province. The project will tie-in to the electricity grid behind the Eskom meter at the respective Sibanye customer substations. A study area is on the following properties:



Solar PV facility:

Portion 9 of Farm Middelkraal No. 466

Grid connection:

- » Farm Middelkraal No. 466 Portions 9, 12, 7, 36, 5, 3
- » Alternative 1: farm Middelkraal 466, Portions 9, 12, 7, 15, 14, 3
- » Alternative 2: farm Middelkraal 466, RE/9, 12, 7, 15, 14, RE/3.
- » Alternative 3: farm Middelkraal 466: RE/9, 12, 7, 36, RE/5, River crossing, 18, RE/3.
- » Alternative addition to Alternative 1 to reach tie in point: RE/3.

The MARIKANA SOLAR PV facility project site is proposed to accommodate the following infrastructure which will enable the PV facility to supply a contracted capacity of up to 30MW:

- » Solar PV array comprising bifacial PV modules and mounting structures, using single axis tracking technology. Once installed, the entire structure will stand up to 5m above ground level.
- » Inverters and transformers.
- » Cabling between the project components.
- » Balance of Plant.
- » On-site facility substation to facilitate the connection between the solar PV facility and Eskom electricity grid. The size and capacity of each of the on-site stations will be 80MVA, 95MVA and 30MVA respectively.
- » An onsite Medium Voltage (MV) switching station forming part of the collector substation.
- » 100MWh Battery Energy Storage System (BESS) per site.
- » Temporary Laydown areas.
- » Access roads, internal roads and fencing around the development area.
- » Up to 132kV Overhead Power Lines (OHPL) – maximum of 30m height with a 15m servitude width
- » Underground LV cabling will be used on the PV sites.

The Scoping study included the identification of potential impacts associated with the project through specialist inputs and consultation with affected parties and key stakeholders. A preliminary evaluation of the extent and expected significance of potential impacts associated with the development of the MARIKANA Solar PV Facility have been detailed in **Chapter 7**. These will be assessed in detail through the EIA Phase assessment, which will include independent specialist assessments.

This scoping study has identified sensitive areas within the development area and grid connection corridor to assist in focussing the location of the development footprint for the MARIKANA Solar PV Facility and associated grid connection in order to minimise the potential for environmental impact. The extent of the project site for the PV facility is ~100ha. A development area of ~160 was demarcated for the placement of the PV facility within the project site, and a grid connection corridor of 200m was identified for consideration in the Scoping Study. The consideration of these larger areas allows an adequate footprint for the installation of a PV energy facility with a contracted capacity of up to 30MW and the proposed grid connection, while allowing for the avoidance of environmental site sensitivities. The size of the development footprint within the development area will be confirmed in the EIA phase once the facility layout is available for assessment.

The majority of potential impacts identified to be associated with the construction of the MARIKANA Solar PV Facility are anticipated to be regional and restricted to the development area itself, while operation

phase impacts/benefits range from local to regional. No environmental fatal flaws were identified to be associated with the development area.

The potentially significant issues related to the construction and operation of the MARIKANA Solar PV Facility include:

- » Disturbance/destruction to and loss of vegetation and fauna and associated habitats
- » Introduction and/or spread of declared weeds and alien invasive plants.
- » Disturbance / degradation / loss of agricultural soils.
- » Increased erosion and sedimentation & contamination of soil and water resources.
- » Mortality of priority bird species due to collision with panels and electrocution and collisions with medium voltage power lines within the facility.
- » Displacement of priority bird species.
- » Loss of land with agricultural capability.
- » Destruction of archaeological and palaeontological heritage.
- » Social impacts, both positive and negative (job creation and business opportunities, impacts associated with construction workers in the area, and economic benefits).

### **8.3. Sensitivity Analysis for the MARIKANA Solar PV Facility**

This section considers the sensitive features located within the development area, as identified by the independent specialists within each respective field, and also indicates the locations of the sensitive features within the development area.

The potentially sensitive areas which have been identified through the scoping study are listed below and illustrated in **Figure 8.1**. The detail is based on the desktop review of available baseline information for the project site, as well as the sensitivity data from specialist studies undertaken during the scoping phase, which included limited field surveys. During the site and desktop surveys, the affected area was investigated in sufficient detail in order to provide definitive insight into the potential for constraining factors on the site. The sensitivity map must be used as a tool by the developer to avoid any areas flagged to be of higher risk or sensitivity and inform the location/layout of the development footprint for the facility and associated infrastructure. The development footprint is the area which will be assessed further in detail in the EIA Phase, in order to provide an assessment of environmental acceptability and suitability of the facility layout of the MARIKANA Solar PV Facility.

#### **9.3.1. Ecological Sensitive Features**

Based on the desktop assessment it can be said that the project area is somewhat sensitive with a moderate-high likelihood of species of conservation concern occurring. This assumption is based on the CBA1, ESA2, NPAES (priority focus area), Magaliesberg IBA and Magaliesberg Biosphere Reserve found in and around the project area.

The expectant anthropogenic activities are likely to drive habitat destruction causing displacement of fauna and flora and possibly event direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the

habitat available for fauna species and may reduce animal populations and species compositions within the area.

### **9.3.2. Freshwater Sensitive Features**

A key consideration for the impact assessment is the presence of the identified water resources in relation to the project area. The available data also suggests the absence of features in the project area, with wetlands system expected for the 500 m regulation area.

Construction could result in the encroachment into water resources and result in the loss or degradation of these system, most of which are functional and provide ecological services. These disturbances could also result in the infestation and establishment of alien vegetation would affect the functioning of the systems. Leaks and/or spillages could result in contamination of the receiving water resources. Contaminated water resources are likely to have an effect on the associated biota. An increase in stormwater runoff could result in physical changes to the receiving systems caused by erosion, run-off and also sedimentation, and the functional changes could result in changes to the vegetative structure of the systems

### **9.3.3. Avifaunal Sensitive Features**

The SABAP2 Data lists 346 avifauna species that could be expected to occur within the area. Fourteen (14) of these expected species are regarded as threatened. Eleven of the species have a low likelihood of occurrence due to lack of suitable habitat and food sources in the project area. *Coracias garrulous* (European Roller), *Falco biarmicus* (Lanner Falcon), *Falco vespertinus* (Red-footed Falcon) has a moderate, high and moderate, respectively. The destruction of habitat along with the risk of electrocutions and collisions is regarded as the greatest risk for avifauna associated with solar plants and associated grid lines

### **9.3.4. Soils and Agricultural Potential Sensitive Features**

Various soil forms are expected throughout the project area, of which some are commonly associated with higher land capabilities. Even though the soil depth, texture and permeability of these soils ensure high land capability, the climatic capability of the area often reduces the land potential considerably. Areas characterised by "High" land potential are expected for selected areas.

The proposed development can result in the loss of land capability. The disturbances could further also result in the infestation and establishment of alien vegetation, which in turn can have a detrimental impact on soil resources. The development of the area could also result in compaction and/or erosion. Further to this, these activities could also cause leaks and/or spillages resulting in contamination of soil resources, which could affect the salinity or pH of the soil, which can render the fertility of the soil unable to provide nutrition to plants.

### **9.3.5. Heritage sensitive features, the cultural landscape (incl. archaeology, palaeontology, and cultural landscape)**

Heritage sensitivity relates to archaeological resources, heritage resources, and the cultural landscape. Databases kept and maintained at institutions such as the PHRA, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and SAHRA's national archive (referred to as the South African Heritage Resources Information System, (SAHRIS) were consulted to determine whether

any heritage resources of significance had been identified during earlier heritage surveys in or near the project area. The larger project area has been subjected to several heritage assessments studies in the past. Literature relating to the pre-historical and the historical unfolding of the region where the project area is located was reviewed. The Phase I HIA study for the proposed MARIKANA Solar PV Facility Project revealed none of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999). Paleo sensitivity is indicated as medium according to the DFFE online screening tool.

As a result of the absence of any heritage resources in the project area no significance rating for any heritage resources or for the possible impact of the MARIKANA PV Solar Facility Project on any heritage resources was undertaken. There is consequently no reason from a heritage point of view why the proposed MARIKANA Solar PV Facility Project could not proceed. However, chance-find procedures for both heritage resources and graves are recommended and are fully outlined in the report.

#### **9.3.6. Visual sensitive features**

The fact that some components of the proposed MARIKANA PV facility and associated infrastructure may be visible does not necessarily imply a high visual impact. Sensitive visual receptors within (but not restricted to) a 3km buffer zone from the facility need to be identified and the severity of the visual impact assessed within the EIA phase of the project.

It is recommended that additional spatial analyses be undertaken to create a visual impact index that will further aid in determining potential areas of visual impact. This exercise should be undertaken for the core PV facility as well as for the ancillary infrastructure, as these structures (e.g., the BESS structures and power line) are envisaged to have varying levels of visual impact at a more localized scale. The site-specific issues (as mentioned earlier in the report) and potential sensitive visual receptors should be measured against this visual impact index and be addressed individually in terms of nature, extent, duration, probability, severity, and significance of visual impact. No no-go areas have been identified at this stage in the process.

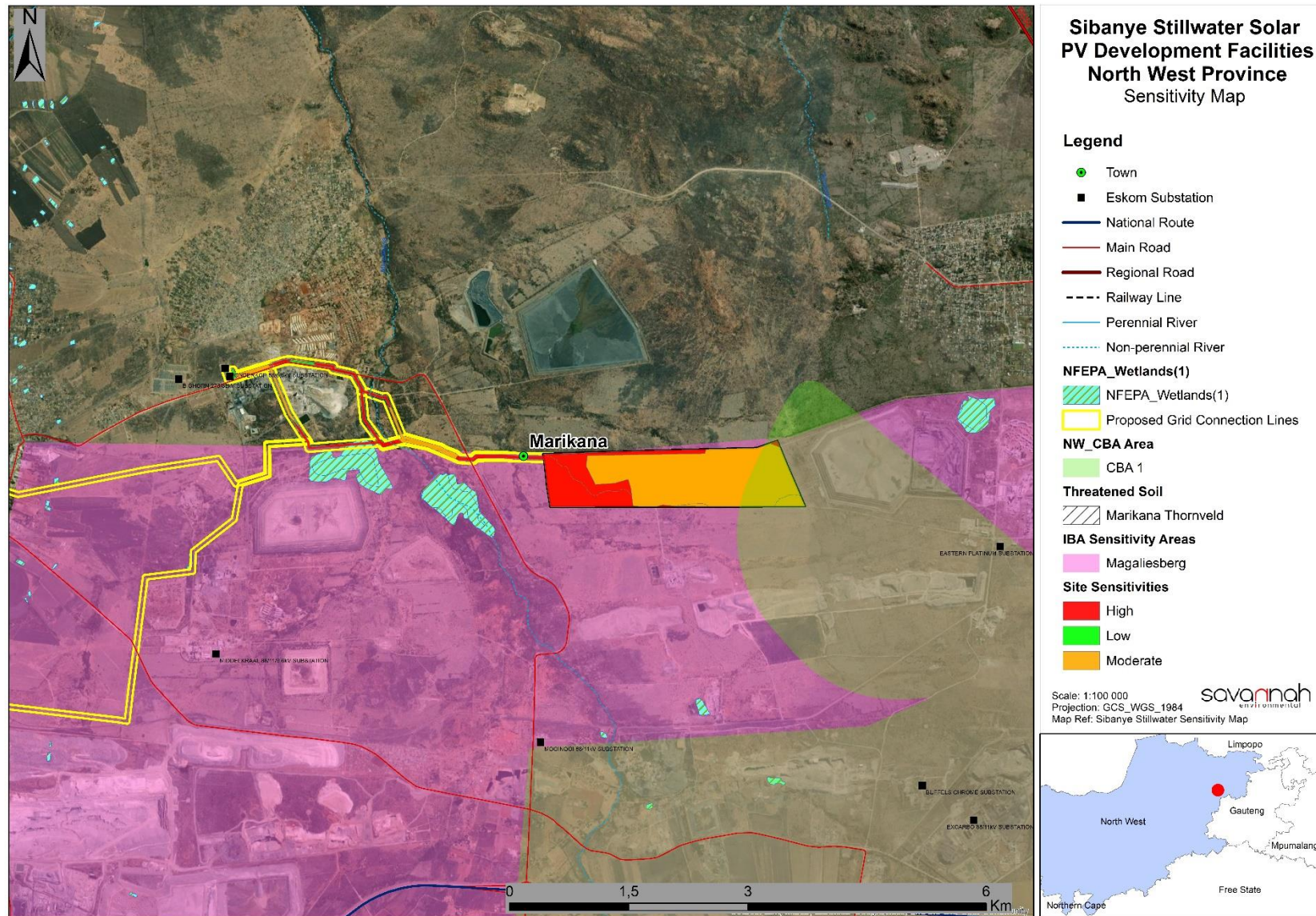
This recommended work must be undertaken during the Environmental Impact Assessment (EIA) Phase of reporting for this proposed project.

#### **8.4. Overall Conclusion and Fatal Flaw Analysis**

The findings of the desktop Scoping Study indicate that no environmental fatal flaws are associated with the MARIKANA Solar PV Facility project site. While some impacts of potential significance do exist, it is anticipated that the implementation of appropriate mitigation measures would assist in reducing the significance of such impacts to acceptable levels. It is however recommended, that the development area for the development of the facility be considered outside of the potential sensitive areas as far as possible in order to ensure that the development does not have a detrimental impact on the environment. This forms part of the 'funnel-down approach' for the identification of an appropriate development footprint within the project site.

With an understanding of which areas within the project site are considered sensitive to the development of the proposed facility, the Applicant can prepare the detailed infrastructure layout for consideration within the EIA Phase. During the EIA phase, more detailed environmental studies will be conducted in line with the Plan of Study for EIA contained in **Chapter 9** of this Scoping Report. These studies will consider the detailed

layouts produced by the Applicant and make recommendations for the implementation of avoidance strategies (if required), and mitigation and management measures to ensure that the final assessed layout retains an environmental impact within acceptable limits. The sensitivity map will be further refined in the EIA phase on the basis of these specialist studies, in order to provide an assessment of environmental acceptability of the final design of the facility.



**Figure 8.1:** Environmental Sensitivity Map from the results of the scoping evaluation for the MARIKANA SOLAR PV FACILITY and do not contain any areas considered to be no-go areas.

## CHAPTER 9 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

One of the key objectives of the Scoping Phase is to determine the level of assessment to be undertaken within the EIA Phase of the process. This will include the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken. This is to determine the impacts and risks a particular activity will impose on a preferred site through the life of the activity (including the nature, significance, consequence, extent, duration, and probability of the impacts) to inform the location of the development footprint within the preferred site.

This Chapter contains the Plan of Study for the EIA for the MARIKANA PV facility, which describes how the EIA Phase will proceed, and includes details of the independent specialist studies required to be undertaken to assess the significance of those impacts identified within the Scoping Study to be of potential significance.

### 9.1. Legal Requirements as per the EIA Regulations, 2014 (as amended) for the Undertaking of a Scoping Report

This chapter of the scoping report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including - (i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity. (ii) a description of the aspects to be assessed as part of the environmental impact assessment process. (iii) aspects to be assessed by specialists. (iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists. (v) a description of the proposed method of assessing duration and significance: (vi) an indication of the stages at which the competent authority will be consulted. (vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and (viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process. (ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	A Plan of Study for the undertaking of the EIA Phase for the MARIKANA PV facility is included within this chapter as a whole.

## 9.2. Objectives of the EIA Phase

The EIA Phase to be undertaken for the MARIKANA PV facility and associated infrastructure will aim to achieve the following:

- » Provide an overall description and detailed assessment of the social and biophysical environment affected by the development of the MARIKANA PV facility and associated infrastructure.
- » Assess potentially significant impacts (direct, indirect, and cumulative, where required) associated with the PV facility.
- » Identify and recommend appropriate avoidance strategies and mitigation measures for potentially significant environmental impacts.
- » Undertake a fully inclusive public involvement process to ensure that I&APs are afforded the opportunity to participate, and that their comments are recorded.

The EIA will assess potential environmental impacts and benefits (direct, indirect, and cumulative impacts) associated with each phase of the development including design, construction, operation, and decommissioning; and will aim to provide the Competent Authority with sufficient information to make an informed decision regarding the proposed development. The site layout being proposed for the MARIKANA PV facility will be assessed through detailed independent specialist studies. As required in terms of the 2014 EIA Regulations (GNR 326), as amended, the assessment will include consideration of the 'do nothing' alternative.

## 9.3. Consideration of Alternatives

The following project alternatives will be investigated in the EIA:

Nature of Alternatives Considered	Description of the Alternatives relating to the MARIKANA PV facility
Site-specific and Layout Alternatives	One preferred project site has been identified for the development of the MARIKANA PV facility due to site specific characteristics such as the solar resource, land availability, topographical considerations, proximity to a viable grid connection and environmental features. The project site is ~220ha in extent which is considered to be sufficient for the development of a MARIKANA PV facility with a contracted capacity of up to 30MW. A development area of ~120 ha has been identified by the proponent within the project site for the development. A development footprint within this development area will be provided by the applicant for consideration in the EIA phase studies.
Activity Alternatives	Only the development of a renewable energy facility is considered by MARIKANA Solar (Pty) Ltd. Due to the location of the project site and the suitability of the solar resource, only the development of a PV facility is considered feasible considering the natural resources available to the area.
Technology Alternatives	Only the development of a Solar PV facility is considered due to the characteristics of the site, including the natural resources available. The use of solar PV for the generation of electricity is considered to be the most efficient technology for the project site. Use of fixed-tilt, single-axis tracking, and/or double-axis tracking PV technology is to be considered. Monofacial or bifacial panels are both to be considered.
'Do-nothing' Alternative	This is the option to not construct the MARIKANA PV facility. No impacts (positive or negative) are expected to occur on the social and environmental sensitive features or aspects located within the project site or the surrounds with the implementation of this



Nature of Alternatives Considered	Description of the Alternatives relating to the MARIKANA PV facility
	option. The opportunities associated with the development of the solar PV for the affected area and other surrounding towns in the area will not be made available.

## 9.4. Description of project to be assessed during the EIA Phase

### 10.4.1. Project description

The aspects or nature and extent of the project to be assessed as part of the EIA are detailed in **Table 9.1** below. A more detailed description of the activities associated with the construction and operation of the project is included in Chapter 2 of this Scoping Report.

**Table 9.1:** Activities and associated infrastructure to be assessed in the EIA

Infrastructure	Footprint and dimensions
Number of Panels	To be confirmed
Panel Height	Up to 5m
Number of inverters and Height	To be confirmed
Technology	Use of fixed-tilt, single-axis tracking, and/or double-axis tracking PV technology. Monofacial or bifacial panels are both considered.
Contracted Capacity	Up to 30MW
Area occupied by the solar array	To be confirmed in the EIA phase
Area occupied by the on-site facility substation	160 ha
Capacity of on-site facility substation	30MW
<b>Battery Energy Storage System technology details</b>	
Battery technology options to be considered	Lithium-Ion Battery technology
Battery Capacity	100MW
Footprint	Under 1 ha
Height	8m
Underground cabling between the PV array and the onsite substation	Underground cabling will be installed at a depth of up to 1.5m to connect the PV array to the on-site facility substation. The cabling will have a capacity of up to 132kV.
Cabling from the onsite substation to the 132kV collector substation	Underground cabling will be installed at a depth of up to 1.5m to connect the on-site substation to the 132kV collector substation. The cabling will have a capacity of up to 132kV.
Area occupied by laydown area	~xx
Access and internal roads	Wherever possible, existing access roads will be utilised to access the project site and development area. It is unlikely that access roads will need to be upgraded as part of the proposed development. Internal access roads (gravel) of 6m in width will be considered.

Infrastructure	Footprint and dimensions			
Grid connection	Capacity	Farm Name/s and no/s.	Alternatives	Infrastructure components
Temporary infrastructure	88Kv	Farm Middelkraal No. 466 Portions 9, 12, 7, 36, 5, 3	<ul style="list-style-type: none"> <li>» Alternative 1: farm Middelkraal 466, Portions 9, 12, 7, 15, 14, 3</li> <li>» Alternative 2: farm Middelkraal 466, RE/9, 12, 7, 15, 14, RE/3.</li> <li>» Alternative 3: farm Middelkraal 466: RE/9, 12, 7, 36, RE/5, River crossing, 18, RE/3.</li> <li>» Alternative addition to Alternative 1 to reach tie in point: RE/3.</li> </ul>	Power line to the Wonderkop sub-station
Temporary infrastructure, including laydown areas, hardstand areas and a concrete batching plant, will be required during the construction phase. All areas affected by temporary infrastructure will be rehabilitated following the completion of the construction phase, where it is not required for the operation phase.				

#### 10.4.2. Scope of the EIA phase and EIA report

The EIA Report will be compiled in terms of the requirements of the EIA Regulations and include the information as required in Appendix 3 of GNR 326. The results of the specialist studies and other available information will be integrated, synthesised, and presented in the EIA Report by the Savannah Environmental project team. The EIA report will assess the overall environmental impacts associated with the development, consider mitigation measures as may be required, and make recommendations regarding the best development alternative. The EIA Report will also identify mitigation measures and provide management recommendations to minimise negative impacts and enhance benefits. The EIA Report will include:

- » The details and expertise of the **EAP** who prepared the report.
- » The **location** of the development footprint of the activity and a locality map illustrating the location of the proposed activity.
- » A **description** of the scope of the proposed activity including all listed activities triggered and a description of associated structures and infrastructure.
- » The **policy and legislative** context within which the development is located and an explanation of how the development complies and responds to the legislation and policy context.
- » The **need and desirability** of the proposed development of the activity in the context of the preferred location.
- » A motivation for the **preferred development footprint** within the approved site as contemplated in the accepted scoping report.
  - \* A description of the **process** followed to reach the proposed development footprint within the approved site, including:
    - \* details of the development footprint considered.
    - \* details of the public participation process undertaken in terms of Regulation 41 of the 2014 EIA Regulations, including copies of supporting documents.
    - \* a summary of issues raised by interested and affected parties and the manner in which the issues were incorporated.
    - \* the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.

- \* the impacts and risks identified including the nature, significance, consequence extent, duration, and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources, and can be avoided, managed, or mitigated.
  - \* the methodology used for determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks.
  - \* positive and negative impacts that the activity and alternatives will have on the environment and the community.
  - \* possible mitigation measures to be applied and the level of residual risk.
  - \* a motivation for not considering alternative development locations.
  - \* a concluding statement indicating the location of the preferred alternative development location; and
  - \* a full description of the process followed to identify, assess, and rank impacts of the activity and associated infrastructure on the preferred location including all environmental issues and risks that have been identified and an assessment of the significance of each issue and risk and the extent to which the issue/risk can be avoided or mitigated.
- » An **assessment** of the identified potentially significant impacts and risks.
  - » A summary of the **findings and recommendations** of any specialist report and an indication as to how these findings and recommendations have been included.
  - » An **environmental impact assessment** containing a summary of key findings, an environmental sensitivity map and a summary of the positive and negative impacts and risks of the proposed activity.
  - » An **Environmental Management Programme** (EMPr), as per Appendix 4 of GNR326, containing the recommendations from specialists, the impact management **objectives**, and the impact management **outcomes**.
  - » The final **alternatives** which respond to the impact management measures, avoidance and mitigation measures identified.
  - » Any aspects which were **conditional** to the findings of the assessment.
  - » Description of the assumptions, uncertainties and gaps in knowledge relating to the assessment and mitigation measures proposed.
  - » An **opinion** as to whether the proposed activity should or should not be authorised and the conditions thereof.
  - » An undertaking under **affirmation** by the EAP in relation to the correctness of the information, the inclusion of comments and inputs from stakeholders and interested and affected parties, the inclusion of inputs and recommendations from the specialists and any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.

The EIA Report will be released to the public, registered I&APs, relevant stakeholders, Organs of State and Authorities for a 30-day review and comment period. Comments received will be captured within a Comments and Responses Report, which will be included within the Final EIA Report, for submission to DEDECT for decision-making.

#### 9.5. Specialist Assessments to be undertaken during the EIA Phase

A summary of the aspects which require further investigation within the EIA Phase through specialist studies, as well as the proposed activities to be undertaken in order to assess and ground truth the significance of the potential impacts is provided within **Table 9.2**. The specialists proposed to undertake detailed studies in the EIA Phase are also reflected within this table. These specialist studies will consider the development

footprint proposed for the PV facility and all associated infrastructure, as well as feasible and reasonable alternatives identified for the project.

**Table 9.2:** Aspects requiring further investigation by specialists during the EIA Phase and terms of reference to assess the significance of the potential impacts relevant to the MARIKANA PV facility

Aspect	Activities to be undertaken in order to assess significance of impacts	Specialist
<p><b>Ecology (Fauna and Flora)</b></p>	<p>The following site-specific assessments are recommended for the EIA Phase:</p> <ul style="list-style-type: none"> <li>» A detailed ecological assessment in accordance with the protocols and procedures of GN 320 of 2020.</li> <li>» Field surveys to prioritise the development areas.</li> <li>» More detailed floristic surveys of main footprint areas in order to document composition, especially of protected species.</li> </ul> <p><u>Assessment of Impacts for the EIA</u></p> <p>The methodology described in <b>Section 9.6</b> assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of criteria including extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral, or positive).</p> <p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p> <p><u>Environmental Management Programme</u></p> <p>For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.</p>	<p>Andrew Husted of the Biodiversity Company</p>
<p><b>Freshwater resources (including all waterbodies and wetlands)</b></p>	<p>The EIA Phase will include the following activities:</p> <p>Freshwater resources located within the development area will be further assessed during the EIA Phase in accordance with the protocols and procedures of GN 320 of 2020 as well as the requirements of the Department of Water and Sanitation Risk Assessment Matrix. The following activities will be undertaken:</p> <ul style="list-style-type: none"> <li>» Identify, delineate, and characterise water resources.</li> <li>» Undertake a functional assessment of systems, where applicable.</li> <li>» Determine a suitable buffer width for the resources.</li> <li>» Undertake a field survey during the wet season period that prioritises the development areas, but also considers the 500m regulated area.</li> </ul> <p><u>Assessment of Impacts for the EIA:</u></p> <p>The methodology described in <b>Section 9.6</b> assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of</p>	<p>Rian of the Biodiversity Company</p>

Aspect	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>environmental impacts is to be assessed by means of criteria including extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral, or positive).</p> <p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p> <p><u>Environmental Management Programme:</u>                      For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.</p>	
<p><b>Avifauna</b></p>	<p><u>The EIA Phase will include the following activities:</u></p> <ul style="list-style-type: none"> <li>» An avifauna impact assessment will be undertaken in accordance with the protocols and procedures of GN 320 of 2020 as well as the Best Practice Guidelines for Solar Developments and will be informed by the results 6-month pre-construction monitoring programme.</li> <li>» The avifaunal specialists report will be structured around the following terms of reference:                             <ul style="list-style-type: none"> <li>* Description of the affected environment from an avifaunal perspective.</li> <li>* Discussion of gaps in baseline data and other limitations.</li> <li>* Description of the methodology that was used for the field surveys.</li> <li>* Comparison of the site sensitivity recorded in the field with the sensitivity classification in the DFFE National Screening Tool and adjustment if necessary.</li> <li>* Provision of an overview of all applicable legislation.</li> <li>* Provision of an overview of assessment methodology.</li> <li>* Identification and assessment of the potential impacts of the proposed development on avifauna including cumulative impacts.</li> <li>* Provision of sufficient mitigation measures to include in the Environmental Management Programme (EMPr).</li> <li>* Conclusion with an impact statement whether the PV facility is fatally flawed or may be authorised.</li> </ul> </li> </ul> <p><u>Assessment of Impacts for the EIA:</u>                      The methodology described in <b>Section 9.6</b> assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of criteria including extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral, or positive).</p>	<p>Lindi Steyn of the Biodiversity Company</p>

Aspect	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p> <p><u>Environmental Management Programme:</u> For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.</p>	
<p><b>Soils and Agricultural Potential</b></p>	<p><u>The EIA Phase will include the following activities:</u></p> <p>The soils impact assessment will include the consideration of aspects related to agricultural aspects in accordance with the protocols and procedures of GN 320 of 2020. The assessment will also include:</p> <ul style="list-style-type: none"> <li>» Identification and delineation of soils forms.</li> <li>» Determination of soil sensitivity.</li> <li>» Undertake a field survey that will prioritise the development areas.</li> </ul> <p><u>Assessment of Impacts for the EIA:</u></p> <p>The methodology described in <b>Section 9.6</b> assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of criteria including extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral, or positive).</p> <p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p> <p><u>Environmental Management Programme:</u> For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.</p>	<p>Andrew Husted of the Biodiversity Company</p>
<p><b>Social</b></p>	<p><u>The EIA Phase will include the following activities:</u></p> <p>Based on the findings of the social impact assessment, the following approach to the EIA Phase studies is proposed:</p> <ul style="list-style-type: none"> <li>» Review comments pertaining to social impacts received from members of the public, key stakeholders, and any organ of state during the public review of the Scoping Report. Where applicable, comments received from the Department of Environment, Forestry and Fisheries on the Final Scoping Report (FSR), which may pertain to social impacts or have relevance to the SIA, will also be reviewed.</li> </ul>	<p>Tony Barbour from Tony Barbour consulting</p>

Aspect	Activities to be undertaken in order to assess significance of impacts	Specialist
	<ul style="list-style-type: none"> <li>» Collect primary data during a site visit. Interview directly affected and adjacent landowners, and key stakeholders to obtain primary information related to the project site, social environment, and to gain their inputs on the proposed project and its perceived social impact (positive and /or negative).</li> <li>» Update the baseline information with information received during the site visit, as well as any additional information received from the client, or updates to the project description.</li> <li>» Assess impacts identified for the project in terms of their nature, extent, duration, magnitude, probability, status, and significance; as well as the degree to which the impact can be reversed, may cause irreplaceable loss of resources, and can be mitigated.</li> <li>» Identify mitigation measures with which to reduce negative impacts and enhance positive impacts for inclusion in the Environmental Management Programme (EMPr). As far as possible the mitigation hierarchy of "avoid, minimise, and reduce" will be followed in the mitigation of potential negative impacts.</li> <li>» Identify any conditions for inclusion in the Environmental Authorisation (EA).</li> <li>» Identify any monitoring requirements for inclusion in the EMPr or EA.</li> <li>» Provide a reasoned opinion regarding the acceptability of the project, and whether the proposed project should be authorised.</li> <li>» Prepare a SIA Report for inclusion in the EIA Report to be prepared for the project.</li> <li>» Subject the SIA Report prepared for the project for inclusion in the EIA Report to external peer review.</li> </ul> <p><u>Assessment of Impacts for the EIA:</u></p> <p>The methodology described in <b>Section 9.6</b> assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of criteria including extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral, or positive).</p> <p>The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures.</p> <p><u>Environmental Management Programme:</u></p> <p>For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.</p>	
<b>Cumulative Assessment</b>	Assess the cumulative impacts associated with the construction and operation of more than one development (i.e., renewable energy developments) within 30km of the project site on the biophysical and social environment.	Savannah Environmental



Aspect	Activities to be undertaken in order to assess significance of impacts	Specialist
	<p>The objective is to identify and focus on potentially significant cumulative impacts so these may be taken into consideration in the decision-making process. The following will be considered:</p> <ul style="list-style-type: none"> <li>» Unacceptable loss of threatened or protected vegetation types, habitat, or species through clearing, resulting in an impact on the conservation status of such flora, fauna, or ecological functioning.</li> <li>» Unacceptable risk to freshwater features through disturbance associated with construction activities and increased runoff and erosion during the operation phase.</li> <li>» Unacceptable risk to avifauna through habitat loss, displacement, and collision with PV infrastructures.</li> <li>» Unacceptable loss of high agricultural potential areas presenting a risk to food security and increased soil erosion.</li> <li>» Unacceptable loss of heritage resources (including palaeontological and archaeological resources).</li> <li>» Unacceptable impact to social factors and components.</li> </ul>	

## 9.6. Methodology for the Assessment of Potential Impacts

Direct, indirect, and cumulative impacts of the above issues identified through this Scoping Study will be assessed in terms of the following criteria:

- » The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional:
  - \* local extending only as far as the development site area – assigned a score of 1.
  - \* limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2.
  - \* will have an impact on the region – assigned a score of 3.
  - \* will have an impact on a national scale – assigned a score of 4; or
  - \* will have an impact across international borders – assigned a score of 5.
- » The duration, wherein it will be indicated whether:
  - \* the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1.
  - \* the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2.
  - \* medium-term (5–15 years) – assigned a score of 3.
  - \* long term (> 15 years) - assigned a score of 4; or
  - \* permanent - assigned a score of 5.
- » The magnitude, quantified on a scale from 0-10, where a score is assigned:
  - \* 0 is small and will have no effect on the environment.
  - \* 2 is minor and will not result in an impact on processes.
  - \* 4 is low and will cause a slight impact on processes.
  - \* 6 is moderate and will result in processes continuing but in a modified way.
  - \* 8 is high (processes are altered to the extent that they temporarily cease); and
  - \* 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » The probability of occurrence, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
  - \* Assigned a score of 1–5, where 1 is very improbable (probably will not happen).
  - \* Assigned a score of 2 is improbable (some possibility, but low likelihood).
  - \* Assigned a score of 3 is probable (distinct possibility).
  - \* Assigned a score of 4 is highly probable (most likely); and
  - \* Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- » the significance, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium, or high.
- » the status, which will be described as either positive, negative, or neutral.
- » the degree to which the impact can be reversed.
- » the degree to which the impact may cause irreplaceable loss of resources.
- » the degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

**S= (E+D+M) P**; where

S = Significance weighting

E = Extent  
D = Duration  
M = Magnitude  
P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- » 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » > 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

Other aspects to be taken into consideration in the specialist studies and EIA report are:

- » Impacts should be described in terms of before and after the proposed mitigation and management measures have been implemented.
- » All impacts should be evaluated for the full lifecycle of the proposed development, including construction, operation, and decommissioning.
- » The impact assessment should take into consideration the cumulative effects associated with this and other similar developments which are either developed or in the process of being developed in the region. The purpose of the cumulative assessment is to test if such impacts are relevant to the proposed project in the proposed location (i.e., whether the addition of the proposed project in the area will increase the impact). In this regard, specialist studies will consider whether the construction of the proposed development will result in:
  - \* Unacceptable risk
  - \* Unacceptable loss
  - \* Complete or whole-scale changes to the environment or sense of place
  - \* Unacceptable increase in impact

A conclusion regarding whether the proposed development will result in any unacceptable loss or impact considering all the projects proposed in the area is included in the respective specialist reports.

MARIKANA Solar (Pty) Ltd has the responsibility to avoid and/or minimise impacts as well as plan for their management (in terms of the EIA Regulations), the mitigation of significant impacts will be discussed. Assessment of mitigated impacts will demonstrate the effectiveness of the proposed mitigation measures.

## **9.7. Authority Consultation**

Consultation with the regulating authorities (i.e., North West DEDECT) has been undertaken in the Scoping Phase and will continue throughout the EIA process. On-going consultation will include the following:

- » Submission of a Final Scoping Report following a 30-day review period which will include all comments and issues raised during the review period as well as appropriate responses to the comments.
- » Submission of an EIA Report and EMP for a 30-day review and comment period.

- » Submission of a Final EIA Report and EMPr following a 30-day review period which will include all comments and issues raised during the review period as well as appropriate responses to the comments received.
- » Consultation and an authority site visit (if required) in order to discuss the findings and conclusions of the EIA Report.

### **9.8. Public Participation Process**

A public participation process will be undertaken by Savannah Environmental during the EIA phase. Consultation with key stakeholders and I&APs will be on-going throughout the EIA Phase. Through this consultation process, stakeholders and I&APs will be encouraged to verify that their issues were recorded in the Scoping Phase, identify additional issues of concern, or highlight positive aspects of the proposed project, and comment on the findings of the EIA Phase. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their inputs, various opportunities will be provided for stakeholders and I&APs to be involved in the EIA Phase of the process, as follows:

- » Focus group meetings (pre-arranged and I&APs invited to attend) via the use of virtual platforms (Zoom, MS Teams) or face-to-face.
- » One-on-one consultation meetings (for example with directly affected and surrounding landowners) via telephone or virtual platforms.
- » Telephonic consultation sessions (consultation with various parties from the EIA project team, including the public participation consultant, lead EIA consultant, as well as specialist consultants).
- » Written, faxed or e-mail correspondence.

The public participation process will include the following activities:

- » Placement of advertisements in local newspapers (Rustenburg Herald in English).
- » Radio advertisement
- » Maintenance and finalisation of the I&AP database.
- » Release of the EIA Report for a 30-day review and comment period.
- » Ongoing consultation with all registered I&APs regarding the progress of the EIA process and the outcomes or findings of the EIA Report through stakeholder consultation via notification letters, telephone calls, and focus group meetings depending on the specific needs of the stakeholders in the area.
- » Facilitate comments on the EIA Report.
- » Question and answer information booklet to help the I&AP understand how their concerns will be addressed
- » Compile a Comments and Responses Report and evidence of the public participation process undertaken to be included in the final EIA Report for decision-making.

### **9.9. Key Milestones of the Programme for the EIA**

The envisaged key milestones of the programme for the EIA Phase are outlined in the following table (and include indicative dates):

<b>Key Milestone Activities</b>	<b>Proposed timeframe</b>
Make the Scoping Report available to the public, stakeholders, and authorities for 30 days	June – July 2022
Finalisation of Scoping Report, and submission of the Final Scoping Report to DEDECT	July 2022
Authority acceptance of the Final Scoping Report and Plan of Study to undertake the EIA	43 days from submission of the Final Scoping Report
Undertake specialist studies and public participation process	June 2022 – August 2022
Make Draft EIA Report and EMPr available to the public, stakeholders, and authorities	September – October 2022
Finalisation of EIA Report, and submission of the Final EIA Report to DEDECT	October 2022
Authority review period and decision-making (107 calendar days)	October 2022 – January 2023

## CHAPTER 10 REFERENCES

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