PROJECT DETAIL

NEAS Reference No.	:	DEA/EIA/0001089/2012
DEA Reference No.	:	14/12/16/3/3/2/307
Project Title	:	The construction of a 75MW photovoltaic solar facility and associated infrastructure on a portion of Portion 1 of the farm Hanskopfontein 40, Registration Division RD, Northern Cape situated within the Sol Plaatje Local Municipality area of jurisdiction.
Authors	:	Ms. Carli Steenkamp Prof. Francois Retief
Client	:	Subsolar Energy (Pty) Ltd.
Report Status	:	Final Scoping Report
Submission date	:	14 August 2012

When used as a reference this report should be cited as: Environamics (2012) Final Scoping Report: Proposed 75MW Photovoltaic Solar facility and associated infrastructure on a portion of Portion 1 of the farm Hanskopfontein 40, Northern Cape Province.

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GLOSSARY OF TERMS AND ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
DEA	Department of Environmental Affairs
DoE	Department of Energy
DWA	Department of Water Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPFI	Equator Principles Financial Institutions
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
GNR	Government Notice Regulation.
I&AP	Interested and affected party.
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
kV	Kilo Volt
Mitigate	Activities designed to compensate for unavoidable environmental damage.
MW	Megawatt
NEMA	National Environmental Management Act No.
NERSA	National Energy Regulator of South Africa
NWA	National Water Act no 36 of 1998.
PPP	Public Participation Process
PV	Photovoltaic
REFIT	Renewable Energy Feed-In Tariff
SAHRA	South African Heritage Resources Act
SDF	Spatial Development Framework

CONTEXT FOR THE PROPOSED PROJECT

According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This growing demand, fueled by increasing economic growth and social development, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmental responsible development, the impacts of climate change and the need for sustainable development. The use of renewable energy technologies, as one of a mix of technologies needed to meet future energy consumption requirements is being investigated as part of Eskom's long-term strategic planning and research process.

The primary rationale for the proposed photovoltaic solar facility is to add new generation capacity from renewable energy to the national electricity mix and to aid in achieving the goal of 42% share of all new installed generating capacity being derived from renewable energy forms, as targeted by the Department of Energy (DoE) (Integrated Resource Plan 2010-2030). In terms of the Integrated Resource Plan (IRP), approximately 8.4GW of the renewable energy mix is planned to be the new installed capacity generated from solar photovoltaic (PV) technologies over the next thirty years.

To contribute towards this target and to stimulate the renewable energy industry in South Africa, the need to establish an appropriate market mechanism was identified, and Feed-in Tariffs (FIT) for renewable energy was set. FITs are, in essence, guaranteed prices for electricity supply rather than conventional consumer tariffs. The basic economic principle underpinning the FITs is the establishment of a tariff (price) that covers the cost of generation plus a “reasonable profit” to induce developers to invest. The establishment of the Renewable Energy Feed-in Tariff (REFIT) in South Africa provides the opportunity for an increased contribution towards the sustained growth of the renewable energy sector in the country, the region and internationally, and promote competitiveness for renewable energy with conventional energies in the medium- and long-term (NERSA, 2009).

In response to the above, Subsolar Energy (Pty) Ltd. is proposing the development of a 75MW photovoltaic solar facility and associated infrastructure for the purpose of commercial electricity generation on an identified site located 30 kilometers north of Kimberley in the Northern Cape Province (refer to Figure 1 and 2 for the locality and regional map). From a regional site selection perspective, this region is preferred for solar energy development due to its annual direct irradiation values.

EXECUTIVE SUMMARY

The Sol Plaatje Local Municipality's (SPM) Integrated Development Plan (IDP, 2011) emphasizes the development of bulk infrastructure to unlock development for economic growth and ensure job creation. Objectives of the IDP include the sustainable delivery in respect of amongst others electricity to all residents of the SPM and to initiate a process for the use of alternative/renewable energy in the municipality (SPLM IDP, 2011). In response Subsolar Energy intends to develop a 75MW photovoltaic solar facility and associated infrastructure on a portion of Portion 1 of the farm Hanskopfontein 40, Registration Division RD, Northern Cape situated within the Sol Plaatje Local Municipality area of jurisdiction.

The proposed development is located approximately 30 kilometers north of Kimberley (refer to Figure 1 and 2 for the locality and regional map). The total footprint of the project will approximately be 150 hectares (including supporting infrastructure on site). The site was identified as being highly desirable due to its suitable climatic conditions, topography (i.e. in terms of slope), environmental conditions (i.e. agricultural potential, geology and archaeology), proximity to a grid connection point (i.e. for the purpose of electricity evacuation), as well as site access (i.e. to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase).

The Environmental Impact Assessment (EIA) Regulations, 2010 (GN. R.543) determine that an environmental authorisation is required for certain listed activities, which might have detrimental effects on the environment. The following activities have been identified with special reference to the proposed development and are listed in the EIA Regulations:

- Activity 10 (GN.R. 544): *"The construction of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more."*
- Activity 1 (GN.R. 545): *"The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more."*
- Activity 15 (GN.R. 545): *"Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more."*

Being listed under Listing Notice 2 (GN.R. 545) implies that the development is considered as potentially having a significant impact on the environment. Subsequently a 'thorough assessment process' is required as described in Regulations 26-35. Environamics has been appointed as independent consultants to undertake the EIA on Subsolar Energy's behalf.

Regulation 28 of the EIA Regulations requires that a scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping. The potential positive and negative impacts associated with the proposed development have been identified. The potentially most significant environmental impacts associated with the development are briefly summarised below:

Impacts during the construction phase:
During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. The potentially most significant impact relates to the direct positive impact through the provision of temporary employment and other economic benefits for the duration of the construction phase.

Impacts during the operational phase:
During the operational phase the study area will serve as an electricity generation facility and the negative impacts are generally associated with the potential increase in storm water runoff, the increased consumption of water, potential for leakage of hazardous materials, and security risks. The operational phase will have direct positive impacts through the provision of employment opportunities for its duration, the generation of additional electricity and the generation of income to the local municipality.

Impacts during the decommissioning phase:
The physical environment will benefit from the closure of the solar facility since the site will be restored to its natural state. However, the decommissioning phase will result in the loss of employment and the generation of waste that will require management measures.

Cumulative impacts:
Since two separate photovoltaic solar facilities (a 75MW and a 19.5MW) are proposed on Portion 1 of the farm Hanskopfontein 40 the Environmental Impact Assessment (EIA) Report will need to conduct a detailed assessment of the cumulative biophysical impacts of both proposed developments.

Regulation 31 of the EIA Regulations determine that an EIA report be prepared and submitted for the proposed activity after the competent authority approves the scoping report. The EIA report will evaluate and rate each identified impact, and identify mitigation measures which may be required. The EIA report will contain information that is necessary for the competent authority to consider the application and to reach a decision contemplated in Regulation 35.

1. INTRODUCTION

This section aims to introduce the Scoping Report and specifically to address the following requirements of the regulations:

28. (1) A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include –
(a) details of –
(i) the EAP who prepared the report; and
(ii) the expertise of the EAP to carry out scoping procedures.

1.1 Legal mandate and purpose of the report

Regulations No. 543, 544 and 545 (of 18 June 2010) promulgated in terms of Section 24(5), 24(M) and 44 of the National Environmental Management Act, (107 of 1998) determine that an Environmental Impact Assessment (EIA) process should be followed for certain listed activities, which might have a detrimental effect on the environment. According to the DEAT 2006 general guidelines the main objectives of the Regulations are: *"… to establish the procedures that must be followed in consideration, investigation, assessment and reporting of the activities that have been identified. The purpose of these procedures is to provide the competent authority with adequate information to make decisions which ensure that activities which may impact negatively on the environment to an acceptable degree are not authorized, and that activities which are authorized are undertaken in such a manner that the environmental impacts are managed to acceptable levels."*

The EIA Regulations No. 544, 545 and 546 outline the activities for which EIA should apply. The following activities with special reference to the proposed development are listed in the EIA Regulations:

- Regulation 544 under Activity 10: *"The construction of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more."*
- Regulation 545 under Activity 1: *"The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more."*
- Regulation 545 under Activity 15: *"Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more."*

Being listed under Listing Notice 1 and 2 (Regulation 544 & 545) implies that the proposed development is considered as potentially having a significant impact on the environment. Subsequently a 'thorough assessment process' is required as described in Regulations 26-35.

According to the DEAT 2006 'General Guide to the EIA Regulations' the purpose of scoping is defined as, *"… to determine the 'scope' of the EIA that will be conducted in respect of the activity for which authorization is being applied for."* The main outcomes of the scoping report will be to highlight key issues, potential environmental impacts and reasonable alternatives. The Scoping phase is also meant to define the nature and extent of specialist studies required in the EIA stage. The objectives of the Scoping study are summarised as follows:

- Identify potential environmental impacts of the proposed development;
- Examine the sustainability of the proposed development in terms of the biophysical, ecological, socio-economic environment;
- Identify environmental issues that require further investigation;
- Identify Interested and Affected Parties (I&APs), inform them of the proposed development and identify any key concerns to be considered in decision making;
- Provide relevant governmental and non-governmental authorities and agencies with the necessary information to make informed decisions regarding the proposed development at the scoping level;
- Consider alternatives, which could be in terms of: site selection, layout, construction materials, processes, engineering solutions and designs and sustainability best practice; and
- Outline the methodology employed to date and proposed activities to be undertaken during the Environmental Impact Assessment (EIA) stage.

This report is the Final Scoping Report to be submitted to the Department of Environmental Affairs. According to Regulation 543 all registered I&APs and relevant State Departments must be allowed the opportunity to review the draft and final scoping reports. The final scoping report will be made available to registered I&APs and all relevant State Departments. They will be requested to provide written comments on the final scoping report within 21 days of receiving the report. All issued identified during this review period will be documented and compiled into a Comments and Response Report as part of the EIA report.

1.2 Details of the environmental assessment practitioner (EAP)

Environamics was appointed by the applicant as the independent EAP to conduct the EIA and prepare all required reports. All correspondence to the EAP can be directed to the following contact details:

Contact person: Carli Steenkamp
Postal Address: PO Box 6484, Baillie Park, 2526
Telephone: 018 –299 1505 (w) 018 – 299 1580 (f)
Electronic Mail: Carli.Steenkamp@nwu.ac.za

Regulation 17 determines that an independent and suitably qualified EAP should conduct the EIA. In terms of the independent status of the EAP a declaration was submitted as part of the application form. The expertise of the EAP responsible for conducting the EIA is summarized in a curriculum vitae included as Appendix A to this report.

1.3 Status of the EIA process

The EIA process is conducted strictly in accordance with the stipulations set out in Regulations 26 to 35 of R543. Table 1 provides a summary of the status of the EIA process and future steps to be taken. It can be confirmed that to date:

- A pre-application site visit and project meeting between the project proponent and the independent environmental assessment practitioner (EAP) was held on 8 March 2012 to discuss the proposed development and assess the site.
- A fully completed application form was submitted to the National Department of Environmental Affairs (DEA) on 20 March 2012 and the Department registered the application on the 28 March 2012.
- The public participation process has been conducted in strict accordance with Regulations 54 to 57 of GN.R. 543. The public participation process was initiated on 28 March 2012 and concluded on 14 May 2012.
- A site visit with the National and Provincial Environmental Departments have been conducted on 22 May 2012.
- The draft scoping report was submitted to the National Department of Environmental Affairs on 25 May 2012.
- The draft scoping report was circulated to registered I&APs and relevant State Departments on 18-20 June 2012 and they were requested to provide their comments on the report within 40 days.

It is envisaged that the Final Scoping report should be accepted during September 2012 and the final EIA report during December 2012. The EIA process should be completed within approximately five months of submission of this report, i.e. by January 2013 – see Table 1.

Table 1: Project schedule

Tasks to be performed	March 2012				April 2012				May 2012				June 2012				July 2012				Aug. 2012				Sept. 2012				Oct. 2012				Sept. 2012			
	1	2	3	4	1	2	3	1	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
REGISTRATION																																				
Submit application form			X																																	
Pre application meeting	X																																			
Site visits	X										X																									
SCOPING PHASE																																				
Public participation																																				
- Press advertisement					X																															
- On site advertisement					X																															
- Complete PP report										X																										
Consultation																																				
- As required by Regs					X																															
- Local authority					X																															
Draft Scoping report											X																									
Final Scoping report																																				
- Circulate																																				
- Submission																							X													
- Approval																																				
POS for EIA report																																				
- Submission																							X													
- Approval																																				
EIA PHASE																																				
Specialist inputs and																																				
- Draft terms of reference																																				
- Receive specialist																																				
Draft EIA Report																																				
Final EIA Report & EMP																																				
- Circulate																																				
- Submission																																				

Environmental authority accept Final EIA report within 60 days after submission according to Regulation 34
Decision and/or indicate specialist review – within 45 days after acceptance of EIA report according to Regulation 35
Appeal period – expires 20 days after IAPs have been informed of the decision according to Regulation 60

1.4 Structure of the report

This report is structured in accordance with the prescribed contents stipulated in Regulation 28 of R543. It consists of nine sections demonstrating compliance to the specifications of the regulations as illustrated in Table 2.

Table 2: Structure of the report

Requirements for the contents of a scoping report as specified in the Regulations		Section in report	Pages
29(1) A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include –			
(a)	details of -	1	1-5
	(i) the EAP who prepared the report; and		
	ii) the expertise of the EAP to carry out scoping procedures.		
(b)	a description of the proposed activity;	2	7-15
(c)	a description of any feasible and reasonable alternatives that have been identified;		
(d)	a description of the property on which the activity is to be undertaken and the location of the activity on the property;		
(e)	a description of the environment that may be affected by the activity and the manner in which the activity may be affected by the environment.	3	16-18
(f)	an identification of all legislation and guidelines that have been considered in the preparation of the scoping report;	4	19-20
(g)	a description of environmental issues and potential impacts, including cumulative impacts, that have been identified;	5	21-28
(h)	details of the public participation process conducted in terms of regulation 27(a), including –	6	29-31
	(i) the steps that were taken to notify potentially interested and affected parties of the application;		
	(ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given;		
	(iii) a list of all persons or organisations that were identified and registered in terms of regulation 55 as interested and affected parties in relation to the application; and		
	(iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues;		
(k)	Copies of any representations, and comments received in connection with the application or the scoping report from interested and affected parties;		
(l)	Copies of minutes of any meetings held by the EAP with interested and affected parties and other role players which record the view of the participants;		
(m)	Any response by the EAP to those representations and comments and views;		

(i)	a description of the need and desirability of the proposed activity;	7	33-34
(j)	A description of the identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity;	N.A.	-
(n)	a plan of study for environmental impact assessment which sets out the proposed approach to the environmental impact assessment of the application, which must include –	8	35-41
	(i) a description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken;		
	(ii) an indication of the stages at which the competent authority will be consulted;		
	(iii) a description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and		
	(iv) particulars of the public participation process that will be conducted during the environmental impact assessment process;		
(o)	any specific information required by the competent authority; and	N.A.	-
(p)	Any other matters required in terms of sections 24(4)(a) and (b) of the Act.	N.A.	-
(2) In addition, a scoping report must take into account any guidelines applicable to the kind of activity which is the subject of the application.		N.A.	-
(3) The EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act.		N.A.	-

2. ACTIVITY DESCRIPTION AND ALTERNATIVES

This section aims to address the following requirements of the regulations:

28. (1) A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include – (b) a description of the proposed activity; (c) a description of any feasible and reasonable alternatives that have been identified; and (c) a description of the property on which the activity is to be undertaken and the location of the activity on the property.

2.1 Project location and description

The activity entails the development of a photovoltaic solar facility and associated infrastructure on a portion of Portion 1 of the farm Hanskopfontein 40, Registration Division RD, Northern Cape situated within the Sol Plaatje Local Municipality area of jurisdiction. The proposed development is located approximately 30 kilometers north of Kimberley – the location of the site is illustrated in Figure 1 and 2.

The site is surrounded by agricultural land uses (grazing) – refer to the plates (attached to this report) for photographs of the development area. The topography of the site is gentle with a slope of less than two percent. The site consists of land suitable for grazing.

The project entails the generation of approximately 75MW electrical power through photovoltaic (PV) panels. The total footprint of the project will approximately be 150 hectares (including supporting infrastructure on site) – refer to table 3 for general site information. The property on which the facility is to be constructed will be leased by Subsolar Energy (Pty) Ltd. from the property owner, Ms. Helena Geyer, for the life span of the project (minimum of 20 years).

Table 3: General site information

Description of affected farm portion	Portion 1 of the farm Hanskopfontein 40, Registration Division RD , Northern Cape
21 Digit Surveyor General code	C03700000000004000001
Title Deed	T4599/1893
Photographs of the site	Refer to the Plates
Type of technology	Photovoltaic solar facility with crystalline silicon panels
Structure Height	Approximately 2.75 meters
Surface area to be covered	150 hectares
Structure orientation	The PV panels will be tilted at a fixed northern angle in order to capture the most sun
Laydown area dimensions	150 hectares
Generation capacity	75MW
Expected production	150 GWh per annum

2.2 Photovoltaic technology

The term photovoltaic describes a solid-state electronic cell that produces direct current electrical energy from the radiant energy of the sun through a process known as the Photovoltaic affect. This refers to light energy placing electrons into a higher state of energy to create electricity. Each PV cell is made of silicon (i.e. semiconductors) which is positively and negatively charged on either side, with electrical conductors attached to both sides to form a circuit. This circuit captures the released electrons in the form of an electric current (direct current). The key components of the proposed project are described below:

- PV Panel Array - To produce 75MW, the proposed facility will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted at a fixed northern angle in order to capture the most sun.

- Wiring to Central Inverters - Sections of the PV array would be wired to central inverters which have a rated power of 500kW each. The inverter is a pulse width mode inverter that converts DC electricity to alternating current (AC) electricity at grid frequency.

- Connection to the grid - Connecting the array to the electrical grid requires transformation of the voltage from 480V to 22,000V. A new substation will be required in order to transform the voltage level from trafo inverter output (22kV) up to the required Eskom level (132kV). The power will therefore be evacuated via an on-site substation, where after it will connect to the existing 132kV overhead power line approximately 1km west of the site (refer to figure 4 for an illustration of the solar photovoltaic electricity generation process). The electricity generated from the solar panels will be transmitted via 132kV overhead lines from the on-site substation to the existing 132kV power line. The transmission line will traverse Portion 24 of the farm Zoutpansfontein 34, which is the property of Mr. Jan W. Weenink.

  The distribution substation will approximately be 90m x 120m in size and will ideally be located in close proximity to the existing power lines. The substation will be a transmission substation and will include transformer bays which will contain transformer oils. Bunds will be constructed to ensure that any oil spills are suitable attenuated and not released into the environment. The substation will be securely fenced.

- Supporting Infrastructure - A control facility with basic services such as water and electricity will be constructed on the site and will have an approximate footprint 400m² or less. Other supporting infrastructure includes voltage and current regulators and protection circuitry. In terms of project maintenance, approximately 450m³ of water would be required per annum for the site.

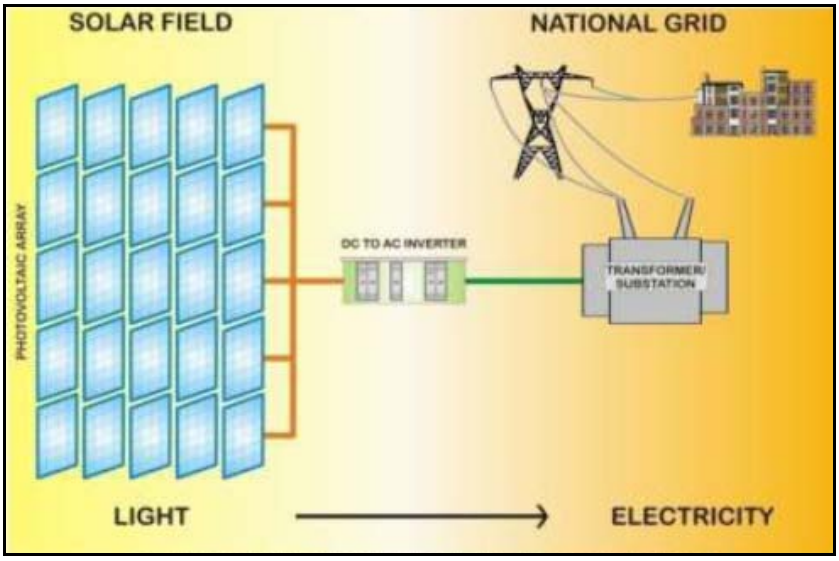


Figure 4: Solar photovoltaic electricity generation process

- Roads - Access to the site is from the dirt road towards Boshoff, off the N12 to Warrenton. An internal site road network to provide access to the solar field and associated infrastructure will be required. Existing farm roads will be used where possible. All site roads will require a width of approximately 4m. Drainage trenches along the side of the internal road network will be installed.

- Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm.

2.3 Layout description

The layout plan will follow the limitations of the site and aspects such as roads, fencing and servitudes will be considered. The total surface area proposed for layout options include the PV panel arrays spaced to avoid shadowing, access and maintenance roads and associated infrastructure (buildings, power inverters, transmission lines and perimeter fences). Due to the nature of the site being used for grazing (refer to the Plates attached as an appendix to this report), limited features of conservation significance exist. However, features to be considered include:

- The water features in the form of non-perennial streams; and
- Pans located north east, south west and south of the site (refer to figure 1).

In this regard a water specialist and an official from the Department of Water will visit the site in order to determine the design alternatives that may be considered for the proposed facility.

Ready access to the site exists from the dirt road towards Boshoff off the national route N12 to Warrenton. The access road is a dirt road. An internal site road network to provide access to the solar field and associated infrastructure will be required. The location of the access road will be detailed based on the geotechnical information during the detail design phase of the PV facility.

2.4 Services provision

Adequate provision of water will be a prerequisite for the development. The Department of Water Affairs has been asked to confirm the water resource availability in the relevant catchment

management area in order to ensure sustainable water supply. It is envisaged that the Department of Water Affairs will be in a position to provide their comments after receipt of the final scoping report. A full assessment of the application for water use authorisation will only be undertaken in the event that the project proponent has been appointed as a preferred bidder by the Department of Energy.

The estimated maximum amount of water required during construction is 200m³ per month during the 12 months of construction. The estimated maximum amount of water required during the facility's 20 years of production is 3 000m³ per annum. The majority of this usage is for the cleaning of the solar panels. Since each panel requires approximately 2 liters of water for cleaning, the total amount of 350 000 panels will require 700 000 liters per wash. It is estimated that the panels may only need to be washed twice per annum, but provision is made for quaternary cleaning (March, May, July, and September). This totals approximately 2,800,000 liters per annum for washing, and allows 200,000 liters per annum (or 548 liter per day) for toilet use, drinking water, etc.

Water saving devices and technologies such as the use of dual flush toilets and low-flow taps, the management of storm water, the capture and use of rainwater from gutters and roofs should be considered by the developer. Furthermore indigenous vegetation will be used during landscaping and the staff will be trained to implement good housekeeping techniques.

2.5 Consideration of alternatives

The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, location, activity, and design alternatives. It is however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognises that the consideration of alternatives is an iterative process of feedback between the developer and EAP, which in some instances culminates in a single preferred project proposal. The following sections explore each type of alternative in relation to the proposed activity.

2.5.1 No-go alternative

This alternative considers the option of 'do nothing' and maintaining the status quo. The description provided in section 3 of this report could be considered the baseline conditions (status quo) to persist should the no-go alternative be preferred. The site is currently zoned for agricultural land uses. Should the proposed development not proceed, the site will remain unchanged and will continue to be used for grazing (refer to plates for photographs of the site). However the land is classified by the Department of Agriculture (NDA, 2006) as having limited irrigation potential, generally not suited to cultivation, and therefore has low agricultural potential. If the no-go alternative prevails the land will continue to be used for low density cattle grazing.

2.5.2 Location alternatives

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity? No other properties have at this stage been legally secured by Subsolar Energy in the Kimberley area to potentially establish solar facilities. From a local perspective, Portion 1 of the farm Hanskopfontein 40 is preferred due to its suitable climatic conditions, topography (i.e. in terms of slope), environmental conditions (i.e. agricultural potential, geology and archaeology), proximity to a grid connection point (i.e. for the purpose of electricity

evacuation), as well as site access (i.e. to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase). Therefore no further property alternatives will be considered in this report. The technical, logistical and environmental characteristics of the site are described in more detail below:

- Climatic conditions: The economic viability of a photovoltaic facility is directly dependent on the annual direct solar irradiation values. A study of available radiation data shows that the proposed site is uniformly irradiated by the sun. In addition the site also experiences temperatures which are suitable for PV technology. The site is located in a region with seasonal, summer and autumn rainfall with an annual precipitation of about 250-300mm. Summer temperatures are high and frequent frost occur in the winter.

- Topography: The topography of the area proposed for the PV facility is predominantly flat, and therefore no shading will be caused by the surrounding topography or vegetation on and around the site.

- Power transmission considerations: The power will be evacuated via an on-site substation, where after it will connect to the existing 132kV overhead power line approximately 360 meters west of the site (refer to figure 1 for an illustration of the solar photovoltaic electricity generation process). The electricity generated from the solar panels will be transmitted via 132kV overhead lines from the on-site substation to the existing 132kV power line.

- Environmental suitability: The development of the proposed PV facility will be constructed within an area of approximately 150 hectares. The proposed development falls within an area previously used for grazing and the site is therefore considered to have limited environmental sensitivity as a result. The National Department of Agriculture (2006) classified land capability into two broad categories, namely land suited to cultivation (Classes I – IV) and land with limited use, generally not suited to cultivation (Classes V – VIII). Figure 5 illustrates that the site falls within Class V, indicated by the light green shade covering the majority of the area. The agricultural potential of the site is therefore limited and the change in land use will not impact on agricultural production.

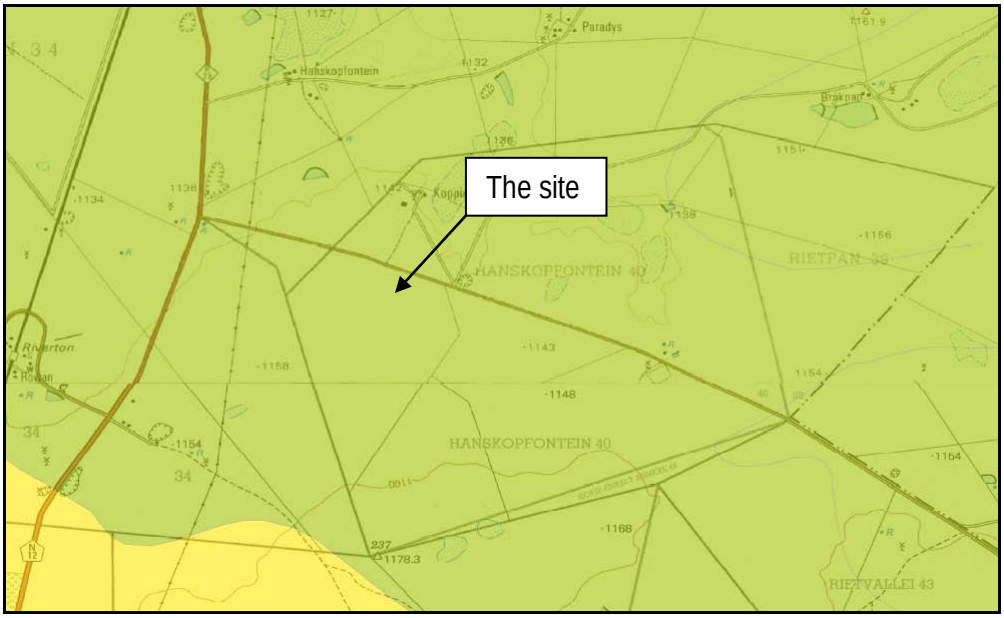


Figure 5: Land capability classification (The National Department of Agriculture, 2006)

2.5.3 Activity alternatives

The scoping process also needs to consider if the development of a photovoltaic solar facility would be the most appropriate land use for the particular site.

Photovoltaic solar facility - Subsolar Energy (Pty) Ltd. is a South African project development company that is focused on developing renewable energy power projects that will produce electricity from clean renewable energy sources, whilst advancing environmental, social and economic upliftment. Subsolar Energy (Pty) Ltd. is of the opinion that solar PV technology is perfectly suited to the site, given the high irradiation values for the Kimberley area. The technology furthermore entails low visual impacts, have relatively low water requirements, is a simple and reliable type of technology and all of the components can be recycled.

Wind energy facility - Due to the local climatic conditions a wind energy facility is not considered suitable as the area does not have the required wind resource. Furthermore the applicant has opted for the generation of electricity via solar power rather than the use of wind turbines. This alternative is therefore regarded as not feasible and will not be evaluated further in this report.

Concentrated Solar Power (CSP) technology - CSP technology requires large volumes of water and this is a major constraint for this type of technology in the proposed project area. While the irradiation values are high enough to generate sufficient solar power, the water constraints render this alternative not feasible. Therefore, this alternative will not be considered further in this report.

2.5.4 Technical alternatives

The electricity generated from the solar panels will be transmitted via either overhead or underground lines to the existing 132kV transmission lines west of the site. Either overhead or underground transmission lines will be constructed. Either of these options would be able to be constructed within a 32m wide servitude.

Overhead Transmission Lines - Overhead lines are less costly to construct than underground lines. Therefore, the preference with overhead lines is mainly on the grounds of cost. Overhead lines allow high voltage operations and the surrounding air provides the necessary electrical insulation to earth. Further, the surrounding air cools the conductors that produce heat due to lost energy (Swingler *et al*, 2006).

The overall weather conditions in the Northern Cape Province are less likely to cause damage and faults on the proposed overhead transmission powerline. Nonetheless, if a fault occurs, it can be found quickly by visual means using a manual line patrol. Repair to overhead lines is relatively simple in most cases and the line can usually be put back into service within a few days. In terms of potential impacts caused by overhead transmission lines include visual intrusion and threats to sensitive habitat (where applicable).

Underground Transmission Lines - Underground cables have generally been used where it is impossible to use overhead lines for example because of space constraints. Underground cables are oil cooled and are also at risk of groundwater contamination. Maintenance is also very difficult on underground lines compared to overhead lines. When a fault occurs in an underground cable circuit, it is almost exclusively a permanent fault due to poor visibility. Underground lines are also more expensive to construct than overhead lines.

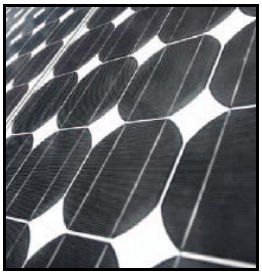
2.5.5 Design and layout alternatives

Design and layout alternatives were also considered throughout the planning and design phase (i.e. what would be the best design option for the development?). In this regard a water specialist and an official from the Department of Water will visit the site in order to determine the layout alternatives that may be considered for the proposed facility. In view of the environmental features on and adjacent the site, the existing water features (in the form of pans and perennial streams) will have to be considered in the final layout plan. A detailed description of the advantages and disadvantages of the various design alternatives will be included as part of the EIA report. The layout plan will also be submitted as part of the EIA Report.

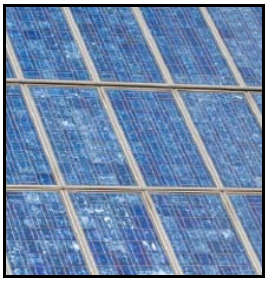
2.5.6 Technology alternatives

There are several types of semiconductor technologies currently available and in use for PV solar panels. Two, however, have become the most widely adopted, namely crystalline silicon and thin film. These technologies are discussed in more detail below:

Crystalline (high efficiency technology at higher cost):
Crystalline silicon panels are constructed by first putting a single slice of silicon through a series of processing steps, creating one solar cell. These cells are then assembled together in multiples to make a solar panel. Crystalline silicon, also called wafer silicon, is the oldest and the most widely used material in commercial solar panels. Crystalline silicon modules represent 85-90% of the global annual market today. There are two main types of crystalline silicon panels that can be considered for the solar facility:



- Monocrystalline Silicon - Monocrystalline (also called single crystal) panels use solar cells that are cut from a piece of silicon grown from a single, uniform crystal. Monocrystalline panels are among the most efficient yet most expensive on the market. They require the highest purity silicon and have the most involved manufacturing process.



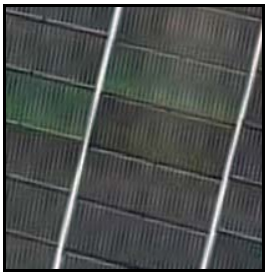
- Multicrystalline Silicon - Multicrystalline (also called polycrystalline) panels use solar cells that are cut from multifaceted silicon crystals. They are less uniform in appearance than monocrystalline cells, resembling pieces of shattered glass. These are the most common solar panels on the market, being less expensive than monocrystalline silicon. They are also less efficient, though the performance gap has begun to close in recent years (First Solar, 2011).

Thin film (low-cost technology with lower efficiency):

Thin film solar panels are made by placing thin layers of semiconductor material onto various surfaces, usually on glass. The term *thin film* refers to the amount of semiconductor material used. It is applied in a thin film to a surface structure, such as a sheet of glass. Contrary to popular belief, most thin film panels are not flexible. Overall, thin film solar panels offer the lowest manufacturing costs, and are becoming more prevalent in the industry. Thin films currently account for 10-15% of global PV module sales. There are three main types of thin film used:

- Cadmium Telluride (CdTe) - CdTe is a semiconductor compound formed from cadmium and tellurium. CdTe solar panels are manufactured on glass. They are the most common type of thin film solar panel on the market and the most cost-effective to manufacture. CdTe panels perform significantly better in high temperatures and in low-light conditions.

- Amorphous Silicon - Amorphous silicon is the non-crystalline form of silicon and was the first thin film material to yield a commercial product, first used in consumer items such as calculators. It can be deposited in thin layers onto a variety of surfaces and offers lower costs than traditional crystalline silicon, though it is less efficient at converting sunlight into electricity.



- Copper, Indium, Gallium,Selenide (CIGS) - CIGS is a compound semiconductor that can be deposited onto many different materials. CIGS has only recently become available for small commercial applications, and is considered a developing PV technology (First Solar, 2011).

The technology that proved most feasible and reasonable with respect to the proposed solar facility is crystalline silicon panels. Although it is more expensive than thin films it is approximately 10 times more efficient, is non-reflective and has a higher durability than thin-film systems. The active material in thin films tends to be less stable than crystalline causing degradation over time and the lower cost to manufacture some of the module technologies is partially offset by the higher area-related system costs (costs for mounting and the land required) due to their lower conversion efficiency. Furthermore thin film modules have higher visibility and reflections.

3. DESCRIPTION OF THE ENVIRONMENT

This section aims to address the following requirements of the regulations:

28. (1) A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include –
(e) a description of the environment that may be affected by the activity and the manner in which the activity may be affected by the environment.

3.1 Site description

The site description deals with land uses on site as well as land uses adjacent the development area (see Plates).

3.1.1 Land uses on and adjacent the site

The site survey revealed that the site consists mainly of low density grazing land (see Plates 1-8). Due to the nature of the proposed development it is not foreseen that the environment will have any impact on the development. Although the surrounding land use is predominantly agriculture, power lines are also located north of the site. Therefore, the proposed land use is not in conflict with the surrounding land use.

3.2 Description of the biophysical environment

The biophysical environment is described with specific reference to geotechnical aspects, topography, soils and general biodiversity. However, due to the fact that the area proposed for development exclusively consists of land used for grazing, nothing of note was identified from an ecological or conservation perspective apart from the existing water features (in the form of pans and perennial streams) that will have to be considered in the final layout plan.

3.2.1 Geotechnical conditions

A detailed Geotechnical Report has been conducted for Portion 1 of the farm Hanskopfontein 40. Bedrock on site occurs as a sill of dolerite associated with the Karoo Dolerite Suite. The sill covers a huge area to the south of the site and is regarded as intrusive into the surrounding sediments of the Prince Albert Formation, Ecca Group, Karoo Supergroup. In addition, calcrete deposits are also indicated in the vicinity. The site is located near the edge of the dolerite intrusion, where a contact with the Prince Albert Formation occurs. Trial holes, however, revealed calcrete at the base of the excavation. It was noted that the calcrete contained inclusions of both dolerite and dolerite inclusions, with the latter being slightly more dominant. The site is described as suitable for the proposed development.

3.2.2 Vegetation and landscape features

In terms of vegetation type the site falls within the Kimberley Thornveld vegetation type (Mucina and Rutherford, 2006). Kimberley Thornveld vegetation is widespread, covering areas of the North

West, Free State and Northern Cape Provinces. The conservation status of this vegetation type is described by Mucina and Rutherford (2006) as 'least threatened'. The vegetation and landscape features are described as plains often slightly irregular with well-developed tree layer with amongst other *Acacia erioloba*. In terms of the National Forests Act of 1998, *A. erioloba* has protected status due to concerns over the large volumes of *A. erioloba* wood being removed for commercial sale of firewood. Many trees are also killed as a result of bush encroachment control through pesticides. In terms of the National Forests Act of 1998 protected tree species may not be cut, disturbed, damaged or destroyed except under license granted by the Department of Forestry (or a delegated authority). Although no Acacia erioloba were observed during the site visit, a limited number of *Acacia erioloba* (commonly known as camel thorn) may be present on site. Due to the extent of the proposed development (150 hectares) a fauna and flora ecological study will be conducted to determine the sensitivity of the habitat and whether *Acacia erioloba* are present onsite.

3.2.3 Soils and climate

The soil profiles encountered consisted of a surface colluvial cover, underlain by hardpan calcrete, presumably hosted in sandstone or dolerite. Soil profiles were limited to a depth of 500mm. The site is located in an area with an approximate Weinert N-value between 7,5 and 10,0; and a Thornthwaite Moisture Index between -40 and -20. Climatically the area may thus be described as semi-arid.Summer and autumn rainfall occur and winters are very dry. The mean annual precipitation varies between 300mm and 500mm. Frost is frequent in the winter. The mean monthly maximum and minimum temperatures for Kimberley are 37,5°C in January and -4,1°C in July, respectively. Subsolar Energy (Pty) Ltd. is of the opinion that solar PV technology is perfectly suited, given the region's high irradiation values.

3.2.4 Visual landscape

The visual impact of photovoltaic facility depends on the complex relationship between the visual environment (landscape), the development (object), and the observer/receptor (e.g. farmer). The establishment of a solar facility on the site is not expected to have a significant visual effect, given that the number of sensitive receptors is very low, electrical infrastructure such as power lines are already located in close proximity to the site and the polycrystalline panels considered for this development are non-reflective. However due to the extent of the proposed development (150 hectares) a visual impact study will be conducted to determine to what extent the proposed development will be visible to observers and whether the landscape provides any significant visual absorption capacity.

3.3 Description of the socio-economic environment

3.3.1 Socio-economic conditions

The following summarizes the economic, socio-economic and demographic status quo of Sol Plaatje Local Municipal area:

- Over the last ten years, the population in Sol Plaatje has grown slowly at an average pace of 0.87% per annum.
- It is estimated that 74,147 people from Sol Plaatje were living in poverty in 2006. Of this amount, 77.5% were from the Black communities. However, these numbers have decreased at an average of 1.7% per annum since 2001.

- The poverty gap in Sol Plaatje has increased in recent years meaning that persons or households lack the resources necessary to be able to consume a certain minimum basket of goods.
- Sol Plaatje's GDP accounts for approximately 31.6% of the Northern Cape's GDP.
- The largest economic role-players in Sol Plaatje are those in the tertiary sector i.e. community services, finance, transport and trade. The mining sector still contributes significantly towards the economy of Sol Plaatje – although it is in a steady declining mode.
- In 2006, the annual disposable income in Sol Plaatje grew at an average of 5.65% per annum from 2001.
- In 2006, there were an estimated 59,332 people employed in Sol Plaatje, which is approximately 25.9% of all people employed in the Northern Cape.
- Between 2001 and 2006, total employment in Sol Plaatje grew at an average of 2.8% per annum. From these findings, the following is apparent:
- Sol Plaatje is a large economic and socio-economic role-player in the Northern Cape economy.
- The economy of Sol Plaatje is heavily dependent on the tertiary sector which is traditionally not very labour intensive.
- Sol Plaatje must be cautious of an economy that is very narrowly based and reliant on a limited number of sectors.
- Growth in the population mainly occurs in the poorer sectors of the population resulting in an increase in the population who are dependent on some sort of state assistance for their existence while there is an increase in the out migration of the more affluent section of the population.

3.3.2 Cultural and heritage aspects

Special attention was given to the identification of possible cultural or heritage resources on site. The initial site investigation concluded that there are no obvious heritage resources located on the site earmarked for development. A Heritage Impact Assessment will be conducted to ensure that there would be no impact on cultural or historical features as a result of the proposed development. From a heritage point of view the following condition will apply:

- To address any subsurface cultural or heritage resources it needs to be clearly stated in the construction environmental management plan, submitted with the EIA report, that SAHRA will be informed immediately should any artefacts be exposed during construction. Training of contractors on heritage issues will also form part of the contractors brief.

4. LEGISLATIVE CONTEXT

This section aims to address the following requirements of the regulations:

28. (1) A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include –
(f) an identification of all legislation and guidelines that have been considered in the preparation of the scoping report.

4.1 Relevant sections of the EIA Regulations

The mandate for EIA lies with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 543, 544 and 545 promulgated in terms of Section 24 of NEMA. This EIA was triggered by activity 10 listed in Regulation R544 and activities 1 and 15 listed in Regulation R545, which requires a 'scoping and environmental impact assessment process.'

4.2 Relevant environmental management legislation

The Environmental Impact Assessment was undertaken in accordance with the Environmental Impact Assessment Regulations (2010) published in GNR 543, in terms of Section 24(5), 24(M) and 44 of the National Environmental Management Act, 1998 (Act No 107 of 1998) as amended; the World Bank EHS Guidelines, the IFC Performance Standards, the Equator Principles and all relevant National legislation and guidelines. Although this report is not written in terms of the Equator Principles (EPs), it fully acknowledges that the EPs will need to be complied with should funding for the project be required.

Title of legislation, policy or guideline:	Administering authority:	Date:
The Constitution of South Africa (108 of 1996)	National Government	1996
The National Environmental Management Act (Act No. 107 of 1998)	National and Provincial Department of Environmental Affairs	1998
The National Water Act (Act No. 36 of 1998)	Department of Water Affairs (DWA)	1998
The National Heritage Resources Act (Act No. 25 of 1999)	South African Heritage Resources Agency (SAHRA)	1999
The National Environmental Management: Waste Act (Act No. 59 of 2008)	Department of Environmental Affairs (DEA)	2008
Conservation of Agricultural Resources Act (Act No. 85 of 1983)	National and Provincial Government	1983
Sol Plaatje Local Municipality Integrated Development Plan (IDP)	Sol Plaatje Municipality	2011
Sol Plaatje Spatial Development Framework (SDF)	Sol Plaatje Municipality	2009

Sol Plaatje Town Planning Scheme	Sol Plaatje Local Municipality	-
Sol Plaatje Local Municipality Bylaws	Sol Plaatje Local Municipality	-
Equator principles	World Bank	2006
World Bank Group Environmental, Health and Safety General Guidelines (EHS Guidelines)	World Bank	2007
Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution	World Bank	2007
International Finance Corporation's Policy on Environmental and Social Sustainability	World Bank	2012

Although the legal mandate for some of the legislation does not lie with the environmental authority it was necessary to take note of these provisions.

4.3 Other legislation

Other legislation mainly refers to the following:

- Planning legislation governing the rezoning process and approval of the layout plan.
- Design standards and legislation for services provision such as water, sewerage, electricity, etc.
- Municipal bylaws related to building plans, building regulations, etc.

4.4 Relevant guidance

The following guidance was considered in conducting the EIA:

- DEA, (2010), Guideline 5 – Draft companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010
- DEAT, (2006), Guideline 3 – General guide to the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 4 – Public participation in support of the Environmental Impact Assessment Regulations
- DEAT, (2006), Guideline 5 – Assessment of alternatives and impacts in support of the Environmental Impact Assessment Regulations

5. DESCRIPTION OF ENVIRONMENTAL ISSUES

This section aims to address the following requirements of the regulations:

28. (1) A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include –
(g) a description of environmental issues and potential impacts, including cumulative impacts, that have been identified.

5.1 Scoping methodology

The contents and methodology of the scoping report aims, as far as possible, to provide a user-friendly analysis of information to allows for easy interpretation.

- Checklist (see section 5.2): The proposed checklist is an approved format accepted by DEA. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.
- Matrix (see section 5.3): The matrix analysis provides a holistic indication of the relationship and interaction between the various development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed development.
- Conceptual model (see section 5.4): The model is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts and related mitigation measures. The environmental management plan as part of the EIA report should aim to formalise the proposed mitigation measures.

5.2 Checklist analysis

The independent consultant together with the developer conducted a site visit on 8 March 2012. The site visit was conducted to ensure a proper analysis of the site specific characteristics of the study area. Table 4 provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format in section 5.3.

Table 4: *Environmental Checklist*

QUESTION	YES	NO	Un-known	Description
1. Are any of the following located on the site earmarked for the development?				
I. A river, stream, dam or wetland	✕			A number of water features, in the form of non-perennial streams and pans, are located on or in close proximity to the site.
II. A conservation or open space area		✕		None.
III. An area that is of cultural importance		✕		None.
IV. Site of geological significance		✕		None.
V. Areas of outstanding natural beauty		✕		None.
VI. Highly productive agricultural land		✕		None.
VII. Flood plain		✕		None.
VIII. Indigenous forest		✕		None.
IX. Grass land		✕		None.
X. Bird nesting sites		✕		None.
XI. Red data species		✕		None.
XII. Tourist resort		✕		None.
2. Will the project potentially result in?				
I. Removal of people		✕		None.
II. Visual Impacts	✕			The visual impact of a low-lying PV facility is not expected to be significant as the number of sensitive receptors in the area is very low and the polycrystalline modules are non-reflective. However a visual impact study will be conducted.
III. Noise pollution		✕		Construction activities will result in the generation of noise over a period of months. The noise impact is unlikely to be significant.
IV. Construction of an access road		✕		None.
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		✕		None.
VI. Accumulation of large workforce (>50 manual workers) into the site.	✕			Approximately 60 employment opportunities will be created during the construction phase of the project.

VII.	Utilisation of significant volumes of local raw materials such as water, wood etc.	✕			The quaternary cleaning of the PV panels will require 2,800,000 liters of water per annum.
VIII.	Job creation	✕			Approximately 68 employment opportunities will be created during the construction and operational phases.
IX.	Traffic generation		✕		None.
X.	Soil erosion		✕		None.
XI.	Installation of additional bulk telecommunication transmission lines or facilities		✕		None.
3.	Is the proposed project located near the following?				
I.	A river, stream, dam or wetland		✕		None.
II.	A conservation or open space area		✕		None.
III.	An area that is of cultural importance		✕		None.
IV.	A site of geological significance		✕		None.
V.	An area of outstanding natural beauty		✕		None.
VI.	Highly productive agricultural land		✕		None.
VII.	A tourist resort		✕		None.
VIII.	A formal or informal settlement		✕		None.

5.3 Matrix analysis

The matrix highlights areas of particular concern (see Table 5). Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented. The matrix also provides an indication if mitigation measures are available.

Table 5: Matrix Analysis

Elements		Significance and magnitude of potential impacts									
		Construction Phase			Operational Phase			Decommissioning Phase			Possible Mitigation
		Minor	Major	Duration	Minor	Major	Duration	Minor	Major	Duration	
PHYSICAL ENVIRONMENT	Flora	-		S	-		L	+		**L**	✓
	Fauna	-		S	-		L	+		**L**	✓
	Air Quality	-		S	*		NA	*		NA	✓
	Soil	-		S	-		L	+		**L**	✓
	Geology	-		S	*		NA	*		NA	✓
	Waste Disposal	-		S	-		L		-	**S**	✓
	Ground Water	-		S	-		L	+		**L**	✓
	Surface Water	-		S		-	L		+	**L**	✓
SOCIAL / ECONOMIC ENVIRONMENT	Employment		+	S		+	L		-	**S**	✓
	Visual Impacts	-		S		-	L	+		**L**	✓
	Traffic Volumes		-	S	-		L	+		**L**	✓
	Health Hazard	-		S	*		NA	*		NA	✓
	Noise Pollution		-	S	*		NA	*		NA	✓
	Tourism	*		NA	*		NA	*		NA	**NA**
	Aesthetics	-		S	-		L	+		**L**	✓
	Archaeology	*		NA	*		NA	*		**NA**	**NA**

(*) No impact (+) Positive Impact (-) Negative Impact (✓) Mitigation Measures Available
(S) Short Term (M) Medium Term (L) Long Term

From the above it is evident that mitigation measures should be available for potential impacts associated with the development.

5.3.1 Physical environment

During the construction phase various minor negative impacts are foreseen over the short term. The latter refers to a period of months. The installation of infrastructure will inevitably result in the removal of top soil with a degree of dust being created in the process. The disposal of waste during construction will additionally require certain management measures.

During the operational phase the study area will serve as an electricity generation facility and the negative impacts are generally associated with the potential increase in storm water runoff and the increased consumption of water.

The physical environment will benefit from the closure of the solar facility since the site will be restored to its natural state. However the disposal of waste during decommissioning will require certain management measures.

5.3.2 Social/Economic environment

The negative impacts during the construction phase relate primarily to the increase in construction vehicle traffic and associated dust and noise pollution. Special care should be taken to minimise the latter. The potentially most significant positive impacts relate to the provision of temporary employment and other economic benefits for the duration of the construction phase.

The negative impacts during the operational phase are generally associated with the visual impact of photovoltaic solar facilities. However the establishment of a solar facility on the site is not expected to have a significant visual effect, given that the number of sensitive receptors is very low, electrical infrastructure such as power lines are already located in close proximity to the site and the polycrystalline panels considered for this development are non-reflective. The operational phase will also have direct positive impacts through the provision of employment opportunities for its duration, the generation of additional electricity and the generation of income to the local municipality.

The decommissioning phase will result in the loss of employment and the generation of waste that will require management measures.

5.4 Conceptual framework

The anticipated key impacts are evaluated for the construction and operational phases of the proposed development respectively. In order to conceptualise the different impacts diagrams are presented, which specify the following (see Diagrams 1 and 2):

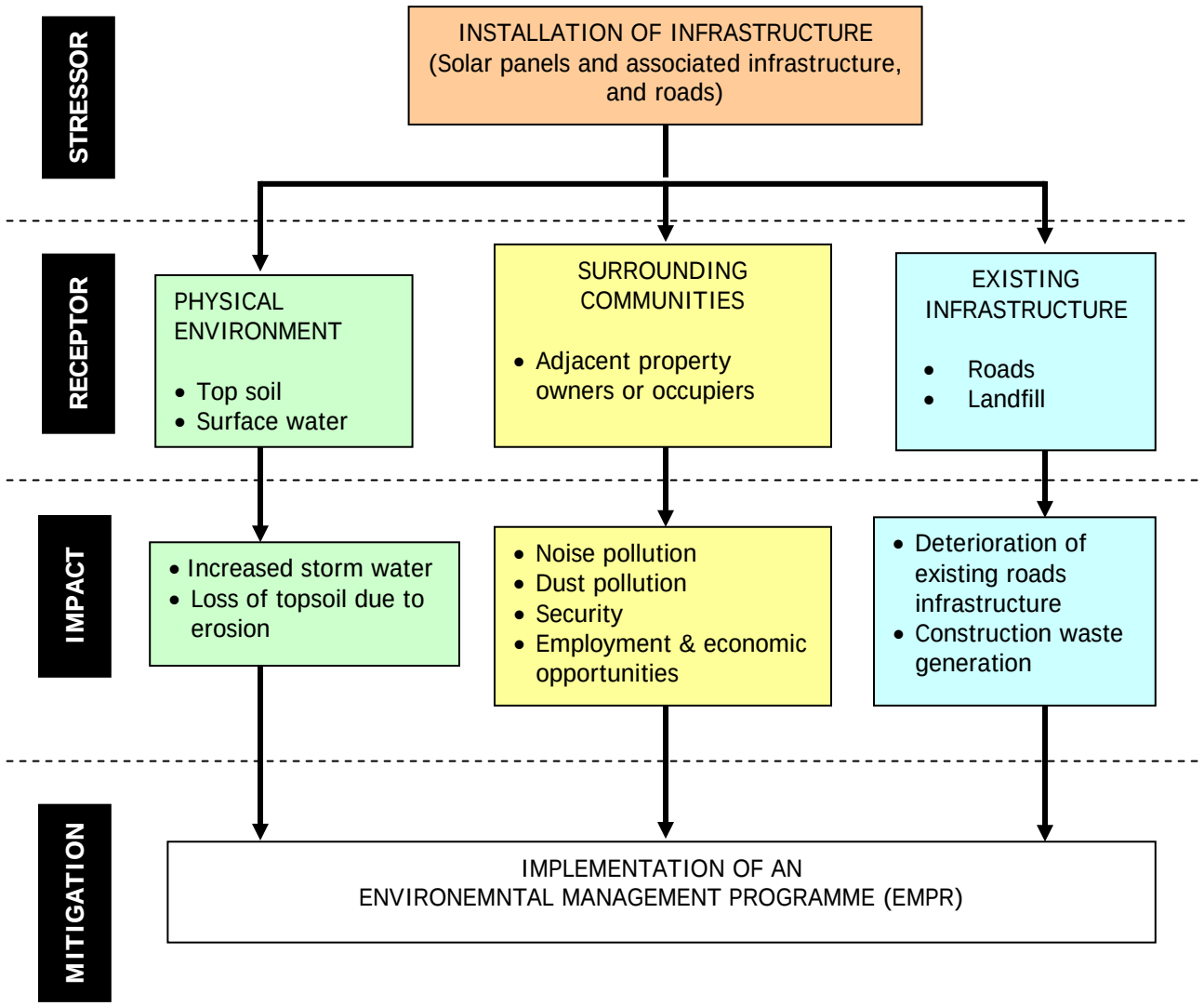
- Stressor: Indicates the aspect of the proposed development, which initiates and cause impacts on elements of the environment.
- Receptor: Highlights the recipient and most important components of the environment affected by the stressor.
- Impacts: Indicates the net result of the cause-effect between the stressor and receptor.
- Mitigation: Impacts need to be mitigated to minimise the effect on the environment.

The scoping process aims to scope potential impacts and focus on the most significant impacts in order to determine key issues for more in depth assessment during the EIA process as well as whether the proposed mitigation measures (if available) would be sufficient.

5.4.1 Impacts during the construction phase

Stressors during the construction phase predominantly refer to the installation of infrastructure relating to the solar panels, supporting infrastructure and internal roads. Receptors refer to the physical and socio-economic environment as well as the existing infrastructure. Diagram 1 provides a conceptual model of the stressors, receptors and impacts. The main mitigation measures would be included in a detailed environmental management programme (EMPr) to be compiled as part of the EIA report.

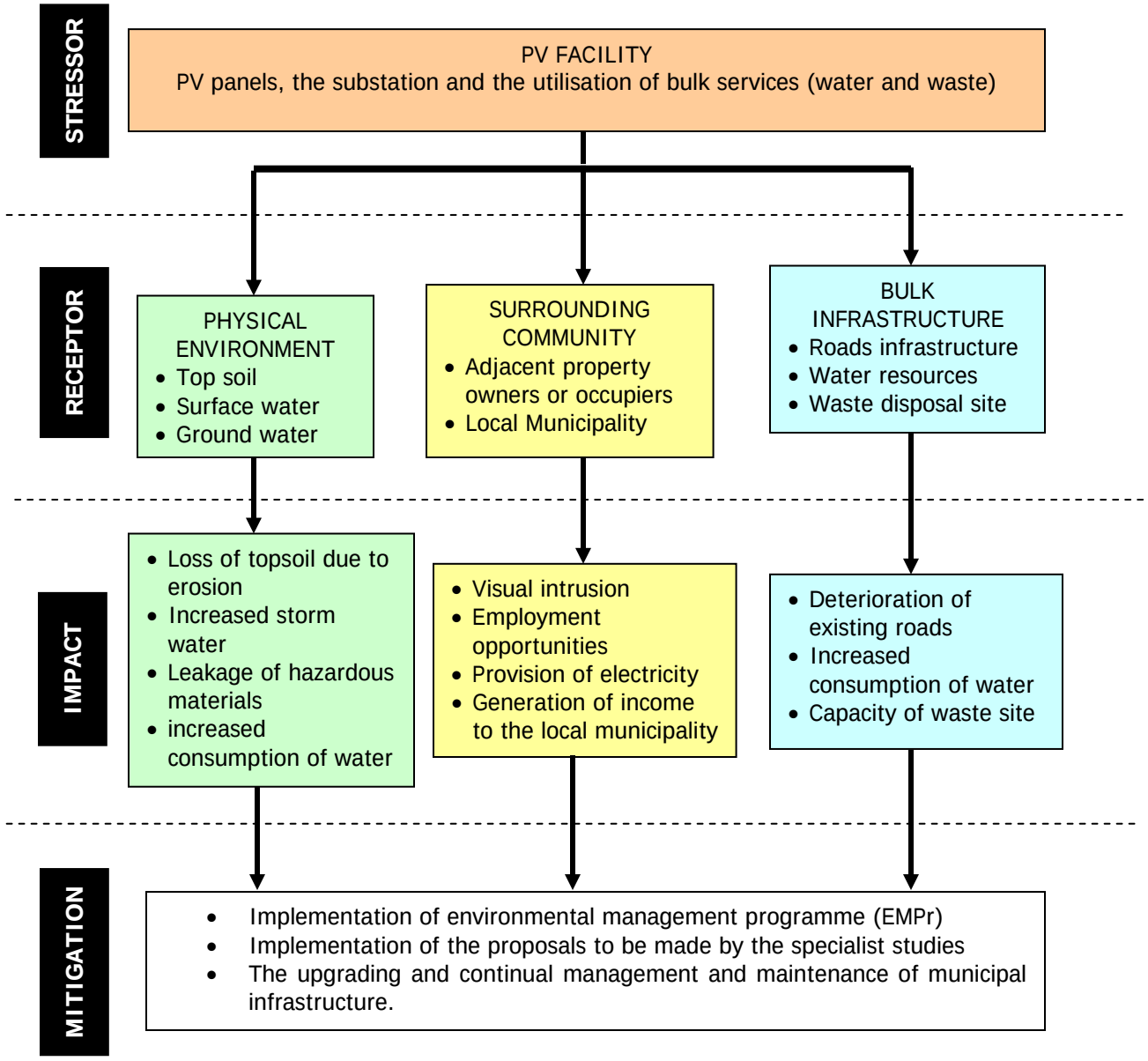
Diagram 1: Conceptual model of impacts during the Construction Phase



5.4.2 Impacts during the operational phase

Stressors during the operational phase predominantly refer to the photovoltaic (PV) facility, and the associated water use and waste production. Receptors refer to the physical and socio-economic environment. Diagram 1 provides a conceptual model of the stressors, receptors and impacts. The main mitigation measures would be included in a detailed environmental management programme (EMPr) to be compiled as part of the EIA report.

Diagram 2: Conceptual model of impacts during the Operational Phase



5.5 Key issues identified

The scoping methodology identified the following key issues which should be addressed in the EIA report.

5.5.1 Impacts during the construction phase

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of months. The potentially most significant impacts relate to the provision of temporary employment and other economic benefits for the duration of the construction phase.

5.5.2 Impacts during the operational phase

During the operational phase the study area will serve as an electricity generation facility and the negative impacts are generally associated with the potential increase in storm water runoff, the increased consumption of water, potential for leakage of hazardous materials, visual intrusion, and security risks. The operational phase will have direct positive impacts through the provision of employment opportunities for its duration, the generation of additional electricity and the generation of income to the local municipality.

5.5.3 Impacts during the decommissioning phase

The physical environment will benefit from the closure of the solar facility since the site will be restored to its natural state. However, the decommissioning phase will result in the loss of employment and the generation of waste that will require management measures.

6. PUBLIC PARTICIPATION AND CONSULTATION

This section aims to address the following requirements of the regulations:

28. (1) A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include –
(h) details of the public participation process conducted in terms of regulation 27(a), including –
(i) the steps that were taken to notify potentially interested and affected parties of the application;
(ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given;
(iii) a list of all persons or organisations that were identified and registered in terms of regulation 55 as interested and affected parties in relation to the application; and
(iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues.

6.1 Public participation process

The public participation process was conducted strictly in accordance with Regulations 27 and 54 to 57. The following three categories of variables were taken into account when deciding the required level of public participation:

- The scale of anticipated impacts
- The sensitivity of the affected environment and the degree of controversy of the project
- The characteristics of the potentially affected parties

Since the scale of anticipated impacts is low, the site already being degraded and the fact that no conflict were foreseen between potentially affected parties, no additional public participation mechanisms were considered. The following actions have already been taken:

- Newspaper advertisement
  Since the proposed development is unlikely to result in any impacts that extent beyond the municipal area where it is located, it was deemed necessary to advertise in a local newspaper only. An advertisement was placed in English in the local newspaper (NoordKaap) on the 4 April 2012 (see Appendix B) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Environamics Environmental Consultants. IAPs were given the opportunity to raise comments within 30 days of the advertisement.

- Site notices
  Two site notices were placed on site in English on the 8 March 2012 to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs were given the opportunity to raise comments by 2 May 2012. Photographic evidence of the site notices is included in Appendix C.

- Direct notification of identified I&APs

  Identified I&APs, including key stakeholders representing various sectors, were directly informed of the proposed development via registered post on 2 April 2012 and were requested to submit comments by 2 May 2012. For a complete list of stakeholder details see Appendix D and for proof of registered post see Appendix E. The consultees included:

  - Northern Cape Department of Environmental Affairs and Nature Conservation
  - The Department of Energy
  - The Department of Water Affairs
  - The National Department of Agriculture
  - The South African Heritage Resources Agency (SAHRA)
  - ESKOM
  - National Energy Regulator of South Africa (NERSA)
  - The Wildlife and Environment Society of South Africa (WESSA)
  - The Frances Baard District Municipality
  - The Sol Plaatje Local Municipality
  - The Local Councilor
  - The Civil Aviation Authority (CAA)
  - The Kimberley Ratepayers association

  It was expected from the key stakeholders to provide their inputs and comments within 30 days after receipt of the notification. To date only the Frances Baard District Municipality, Department of Agriculture, WESSA, CAA and SAHRA provided feedback (see Appendix F for written comments).

- Direct notification of surrounding land owners and occupiers

  Written notices were also provided to all surrounding land owners and occupiers on 12 April 2012. For a list of surrounding land owners see Appendix D. To date only Transnet has provided feedback (see Appendix F for written comments).

- Circulation of draft scoping report

  Since no one requested to be registered as an I&AP, the draft scoping report was circulated to the following key stakeholders:

  - The North West Department of Agriculture, Conservation, Environment and Rural Development (NWDEDECT)
  - The Sol Plaatje Local Municipality

  The key stakeholders were requested to provide their inputs and comments within 30 days after receipt of the draft report. To date only the Northern Cape Department of Environmental Affairs and Nature Conservation provided feedback (see Appendix F for written comments).

6.2 Consultation process

Regulation 54 requires that the municipality, relevant ward councillor and any organ of state having jurisdiction in respect of any aspect of the activity should be given written notice of the activity. A complete list of all the consultees who received written notice as well as proof of registered post is attached as Appendices D and E.

6.3 Registered IAPs

IAPs include all stakeholders who deem themselves affected by the proposed development. To date no one has requested to be included as a registered I&AP. According to Regulation 56(1) "*A registered interested and affected party is entitled to comment, in writing, on all written submissions, including draft reports made to the competent authority*". This report is the Final Scoping Report to be submitted to the Department of Environmental Affairs. The final scoping report will be made available to the following I&AP and State Departments:

- Northern Cape Department of Environmental Affairs and Nature Conservation
- The Department of Water Affairs
- The National Department of Agriculture
- ESKOM
- The Wildlife and Environment Society of South Africa (WESSA)
- The Frances Baard District Municipality
- The Sol Plaatje Local Municipality
- Transnet

They will be notified of the availability of the final report and will be requested to provide written comments on the report within 21 days. All issued identified during this review period will be documented and compiled into a Comments and Response Report in the EIA report.

6.4 Issues raised by IAPs and consultation bodies

Table 6 summarizes the comments received from consultation bodies. The full wording and original correspondence is included in Appendix F.

Table 6: Issues raised by key consultation bodies

Organisation	Person	Written comment (refer to Appendix F)
The Frances Baard District Municipality	The Director: Planning and Development: Mr. Frank Mdee	The District municipality stated in a letter dated 7 May 2012 that they are in support of the development as it will provide alternative sources of energy. They also stated that the proposed development is on a farm therefore an application of special use should be lodged with the relevant authority in terms of the Northern Cape Planning and Development Act, 7 of 1998.
Department of Agriculture	Agriland Support Group: Thoko Buthelezi	The Department confirmed receipt of documents in an e-mail dated 23 May 2012. Ms. Thoko stated that the application with Agriland reference number 2012_01_0055/51 *(hanskopfontein) is on step 5 of 8, which means that the application is currently waiting to be presented to the land use and soil management committee.
ESKOM	Manager Key Customer Relations (NW Region):	Eskom confirmed receipt of an application for a cost estimate for the construction of a solar plant on Portion 1 of the farm Hanskopfontein 40 in an e-mail dated 14 June 2012 and stated that they have objections to the

	Mr. Piet Ferreira	developments and that the relevant departments within Eskom will in due time provide the cost estimate letters for all projects.
WESSA	Chairperson: Ms. Suzanne Erasmus	WESSA stated in a letter dated 12 April 2012 that their office for the Northern Cape is understaffed and run by a group of volunteers. They will not be participating in the EIA process at this time.
CAA	Acting Manager AOG: Mr. Christopher Isherwood	The CCA confirmed in a letter dated 7 May 2012 that after evaluating the site position and reviewing the information received in February 2012, the CAA has no objection to the proposed Energy Facility Development with a maximum height restriction of 9m above ground level.
SAHRA	The Chief executive officer: Ms. Colette Scheermeyer	SAHRA acknowledged receipt of our notice and set out the requirements for a heritage impact assessment in a letter dated 22 May 2012.
Northern Cape Department of Environmental Affairs and Nature Conservation	Principal Environmental Officer: Impact Management: Chamuwari Ketano	The DENC noted the following concerns: 1. The quantities of hydrocarbons (diesel) that will be stored on site for the trucks during site clearance and the construction phase. Emergency and spillage plans need to be developed and submitted to the relevant authorities for approval. 2. Presumably a construction camp will be erected during project construction phase. Kindly indicate the how basics services (water, electricity and sewerage disposal) will be provided to workers on site. 3. A detailed site layout plan needs to be submitted to the competent authority. 4. A detailed assessment of the cumulative biophysical impacts of both proposed developments on portion 1 of farm Hanskopfontein.
Transnet	Mr. André Bodenstein	Mr. Bodenstein confirmed that his office has no objection against this proposed development, since the possible development sites are situated between 2 & 4 kilometres from the nearest Transnet property. He requested that the local TFR Infrastructure office (Kimberley - Riaan Karriem 053-838 3008) be contacted for way leave agreements between Transnet and the applicant should any crossing of the railway line take place due to the proposed development.

This section aims to address the following requirements of the regulations:

28. (1) A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include –
(i) a description of the need and desirability of the proposed activity.

7.1 The need for the proposed development

The proposed development is a direct result of the growing demand for electricity and the need for renewable energy forms in South Africa. According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This growing demand, fueled by increasing economic growth and social development, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmental responsible development, the impacts of climate change and the need for sustainable development. The use of renewable energy technologies, as one of a mix of technologies needed to meet future energy consumption requirements is being investigated as part of Eskom's long-term strategic planning and research process.

The primary rationale for the proposed photovoltaic solar facility is to add new generation capacity from renewable energy to the national electricity mix and to aid in achieving the goal of 42% share of all new installed generating capacity being derived from renewable energy forms, as targeted by the Department of Energy (DoE) (Integrated Resource Plan 2010-2030). In terms of the Integrated Resource Plan (IRP), approximately 8.4GW of the renewable energy mix is planned to be the new installed capacity generated from solar photovoltaic (PV) technologies over the next thirty years.

The establishment of the photovoltaic solar facility will significantly contribute to achieving this objective and will also address electricity provision as a priority need in the Sol Plaatje local municipality (Sol Plaatje IDP, 2011-2012:59-60). The Sol Plaatje Local Municipality's Integrated Development Plan (Sol Plaatje IDP, 2011/12:27) reveals that there are still people in some areas of the municipality that use candles, paraffin or wood for heating and lighting.

7.2 The desirability of the proposed development

The development of a solar facility will have several benefits for society in general, some of which are discussed below:

- Security of power supply - The project has the potential of "securing" economic activity by assisting in removing supply constraints if Eskom generation activities result in a supply shortfall. When supply is constrained it represents a limitation to economic growth. When a supply reserve is available, it represents an opportunity for economic growth.

- Local employment - The proposed project will contribute to local economic growth by supporting industry development in line with provincial and regional goals and ensuring advanced skills are drawn to the Northern Cape Province. The project will likely encounter

widespread support from government, civil society and businesses, all of whom see potential opportunities for revenues, employment and business opportunities locally. The promotion and development of photovoltaic solar facilities, which will in turn lead to growth in tax revenues and sales of carbon credits, will result in increased foreign direct investment.

- Reduced air pollution, carbon dioxide emissions and water consumption - The additional power supplied through solar energy will reduce the reliance on the combustion of fossil fuels to produce power. The reduction of GHG emissions as a result of the project implementation will be achieved due to reduction of CO2 emissions from combustion of fossil fuel at the existing grid-connected power plants and plants which would likely be built in the absence of the project activity. Coal power also requires high volumes of water, in areas of South Africa where water supply is already over-stretched and water availability is highly variable.

- Lower costs of alternative energy - An increase in the number of solar facilities commissioned will eventually reduce the cost of the power generated through solar facilities. This will contribute to the country's objective of utilising more renewable energy and less fossil fuel based power sources. It will assist in achieving the goal to generate 10 000 GWh of electricity from renewable energy by 2013 and the reduction of South Africa's GHG emissions by approximately 34% below the current emissions baseline by 2020.

- Increased surety of supply and increased quantity of available power - By diversifying the sources of power in the country, the surety of supply will increase. Additionally, the power demands of South Africa are ever increasing and by adding solar power this demand can be met, even exceeded without increasing pollution in relation to the use of fossil fuels.

- Provision of job opportunities - The main benefit of the proposed development operating in the area is that local companies or contractors will be hired for the duration of the construction period. The operational phase will provide permanent job opportunities to the local communities since security guards and general labourers will be required on a full time basis.

- Generation of income to the Local Municipality - In addition to the provision of job opportunities, it is required that the applicant donate approximately R4 200 000 per annum on local socio economic development, and approximately R1 500 000 per annum on local enterprise development. This will be for the full length of the project (minimum of 20 years). Therefore the local community may be granted the opportunity to improve their social and economic situation.

This section aims to address the following requirements of the regulations:

28. (1) A scoping report must contain all the information that is necessary for a proper understanding of the nature of issues identified during scoping, and must include –
(n) a plan of study for environmental impact assessment which sets out the proposed approach to the environmental impact assessment of the application, which must include –
(i) a description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken;
(ii) an indication of the stages at which the competent authority will be consulted;
(iii) a description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and
(iv) particulars of the public participation process that will be conducted during the environmental impact assessment process.

8.1 Approach to EIA

This section gives a brief outline of the process Environamics will follow when compiling the Environmental Impact Report (EIR) for the construction of the proposed 75MW photovoltaic solar facility. The approach to the EIA is to focus on those key issues identified during the scoping process. This will ensure that the EIA focus on the most significant impacts and in the process save time and resources. During this phase, specialist studies will be undertaken to assess all potential impacts that are significant. The specialist studies will assess impacts on both the social and the biophysical environment. The studies will also help in identifying ways that can help to mitigate the envisaged impacts.

Table 7 provides a summary description of:

- Key environmental issues;
- Key questions to be addressed as part of the EIA;
- Tasks to be performed in order to address the questions;
- Specialist to be involved (if applicable);
- Methods to be applied; and
- Target date for completion of the task.

The EIA will thus aim to identify impacts and make proposals to avoid them, and where they cannot be avoided to mitigate them to acceptable levels.

Table 7: Summary of tasks and methods as part of EIA process

Key issues	Question to be addressed (terms of reference)	Task	Specialist to be appointed (if applicable)	Method to be applied	Target date for completion
CONSTRUCTION PHASE					
Addressing impacts associated with construction activities	➢ How will the construction process be managed to minimize and avoid environmental impacts?	The EAP to compile an environmental management programme (EMPr).	N/a	Review of best practice EMP to be included in the contractual agreements and tender documentation	Included with submission of EIA report.
OPERATIONAL PHASE					
Addressing impacts associated with operational activities	➢ How will the facility be managed to minimise and avoid environmental impacts?	The EAP to compile an environmental management programme (EMPr).	N/a	Review of best practice EMPr	Included with submission of EIA report.
Provision of sustainable water supply	➢ Will sustainable water supply be available to the proposed development?	The EAP to consult with the Department of Water Affairs on the availability of water.	N/a	As determined by the Department of Water Affairs	Included with submission of EIA report.
Geotechnical suitability	➢ Determine the feasibility of the site in terms of the geotechnical conditions.	A geologist to conduct a geotechnical investigation, comprising a geotechnical soil investigation and a dolomite stability investigation.	Geologist	As determined by specialist	Included with submission of EIA report.
Heritage and archeological impacts	➢ Will the proposed development impact on any heritage or archeological artifacts?	An archeologist to conduct a heritage and archeological study.	Archeologist	As determined by specialist	Included with submission of EIA report.

Ecological Impacts	➢ What will the impact of the proposed development be on the ecology?	Ecologist to conduct an ecological fauna and flora habitat survey.	Ecologist	As determined by specialist	Included with submission of EIA report.
Visual impacts	➢ To what extent will the proposed development be visually intrusive to the surrounding communities?	A visual specialist to conduct a visual impact assessment.	Visual specialist	As determined by specialist	Included with submission of EIA report.
Socio-economical impacts	➢ How will the proposed development impact on the socio-economic environment?	Specialist to conduct a social impact assessment and prepare socio-economic development plans.	Socio-economic specialist	As determined by specialist	Included with submission of EIA report.
Agricultural impacts	➢ What will the impact of the proposed development be agricultural resources?	Agricultural economist to conduct an agriculture potential study (soil survey).	Agricultural economist	As determined by specialist	Included with submission of EIA report.
DECOMMISIONING PHASE					
Addressing impacts associated with decommissioning activities	➢ How will the decommissioning process be managed to minimize and avoid environmental impacts?	The EAP to compile a environmental management programme (EMPr)	N/a	Review of best practice EMPr	Included with submission of EIA report.
CUMMULATIVE IMPACTS					
Addressing cumulative impacts associated with the development of two separate facilities on Portion 1 of the farm Hanskopfontein.	➢ How will the cumulative biophysical impacts resulting from the proposed facilities be managed?	The EAP to conduct a detailed assessment of the cumulative biophysical impacts of both proposed facilities on portion 1 of farm Hanskopfontein.	N/a	Cumulative effects assessment.	Included with submission of EIA report.

8.2 Public participation process

According to Regulation 543 all registered I&APs and relevant State Departments must be allowed the opportunity to review the draft/final scoping report. Although no requests were received from I&APs to be included as registered I&APS, all relevant State Departments will be given an opportunity to forward their written comments within 21 days of receiving the final scoping report. All issued identified during this review period will be documented and compiled into a Comments and Response Report in the EIA report.

All registered I&APs and relevant State Departments will be given the opportunity (40 days) to review the draft EIR in accordance with Regulation R543 and provide their written comments within that period. This will be done in order to assess and provide I&APs an opportunity to comment on the specialist studies, alternatives investigated, recommendations and conclusions. All issued identified during this public review period will be documented and compiled into a Comments and Response Report. After comments from the public on the draft EIR have been received and incorporated into the report, the final EIR will be submitted to the National Department of Environmental Affairs for consideration. In addition, prior to submission to the authorities, registered I&APs and relevant State Departments would be afforded, unless otherwise indicated by DEA, at least 21 days to comment on the final report.

8.3 Method of environmental assessment

The environmental assessment aims to identify the various possible environmental impacts that could results from the proposed development. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in Table 8.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

8.3.1 Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the project phases:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should

also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact the following criteria is used:

Table 8: *The rating system*

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be

		considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.

CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects

SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity. The summation of the different criteria will produce a non weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

9. CONCLUSION

This Scoping Report aimed at identifying the 'scope' of the EIA that will be conducted in respect of the activity for which authorization is being applied for. It can be concluded that:

- The scoping phase complied with the specifications set out in Regulations 26 to 29.
- All key consultees have been consulted as required by the Regulations 26 and 54 to 57.

Based on the contents of the report the following key environmental issues were identified which need to be addressed in the EIA report:

- Impacts during the construction phase to be addressed through an environmental management programme.
- Impacts during the operational phase:
  - Increase in storm water runoff
  - Increase in consumption of water
  - Potential for leakage of hazardous materials
  - Visual intrusion
  - Security risks
  - Permanent employment opportunities
  - Generation of additional electricity
  - Generation of income to the Local Municipality
- Impacts during the decommissioning phase:
  - Generation of waste
  - Loss of employment
- Cumulative biophysical impacts resulting from both the proposed facilities on portion 1 of farm Hanskopfontein.

The latter issues will be addressed in more detail in the EIA report. The EAP thus recommend that:

The scoping report be approved after which the EIA process, as required by Regulations 31 to 35 can commence.

We trust that the department find the report in order and eagerly await your final decision in this regard.

Ms. Carli Steenkamp
Environamics Environmental Consultants

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