



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

Application Number:

Date Received:

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

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **tick** the boxes that are applicable or **black out** the boxes that are not applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. The use of “not applicable” in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner.
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? YES

If YES, please complete form XX for each specialist thus appointed: **Internal CES specialists the same EAP**

Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail

BACKGROUND

InnoWind (Pty) Ltd (hereafter referred to as InnoWind) proposes to construct a 10 Mega Watt (MW) Photovoltaic (PV) solar energy facility on land located about 7 kilometres to the north of Peddie in the Eastern Cape Province of South Africa. The proposed project will entail the construction and operation of the PV solar energy facility on about 18-19 Hectares (Ha) of land that is designated as communal land and which is currently used mainly for the informal grazing of livestock.

The Peddie 10 MW Solar PV project will also register to generate carbon credits in terms of the Clean Development Mechanism (CDM) under the Kyoto Protocol or other suitable carbon scheme.

It is anticipated that the footprint of the Peddie PV facility will cover an area of approximately 17 Ha, based on an expected footprint of 1.7 Ha per 1.0 MW array. Other associated infrastructure such as inverters and transformers, internal electrical reticulation, a storage facility and internal roads will contribute a further 1-2 Ha to the overall footprint. Therefore, the total transformed area is calculated to be at most 18-19 Ha in total.

Site	Distance to Peddie Subs (km)	Productible (kWh/kWp/yr)	Area without 100 m fence (ha)	Reserved Area for alley's, cabins.	Net Solar field area (ha)
PV 1	1.2	1600	19.0	10%	17.1
PV 2	1.7	1600	19.0	10%	17.1
PV 3	2.8	1600	19.0	10%	17.1
PV 4	2.9	1600	19.0	10%	17.1

The proposed development falls under the jurisdiction of Ngqushwa Local Municipality (NLM), in the Eastern Cape Province. The proposed PV facility will be connected onto the grid via a **XX** kV power line to the Eskom substation, adjacent to the site.

InnoWind requires authorisation from the National Department of Environmental Affairs (DEA), in terms of the Environmental Impact Assessment Regulations, 2010 promulgated in terms of the National Environmental Management Act 107 of 1998 (NEMA), as amended.

Coastal and Environmental Services (CES) has been appointed by InnoWind as the independent consultant to undertake the necessary environmental investigations for the Peddie PV Facility, and to apply for the required authorisation from the Department of Environmental Affairs (DEA).

LOCATION OF THE PROJECT

The proposed development site is located alongside the R345 access road between Peddie and the Bongweni and eLalini villages, about 7.0 Kilometres to the north west of Peddie. The town of Peddie itself is located on the N2 about half way between King William's Town and Grahamstown (Figure 1-1).

Figures 1-2 and 1-3 below show the locations of the three preferred PV sites at PV1, PV2 and PV4 along the R345 adjacent to the north of the Bongweni and eLalini villages.

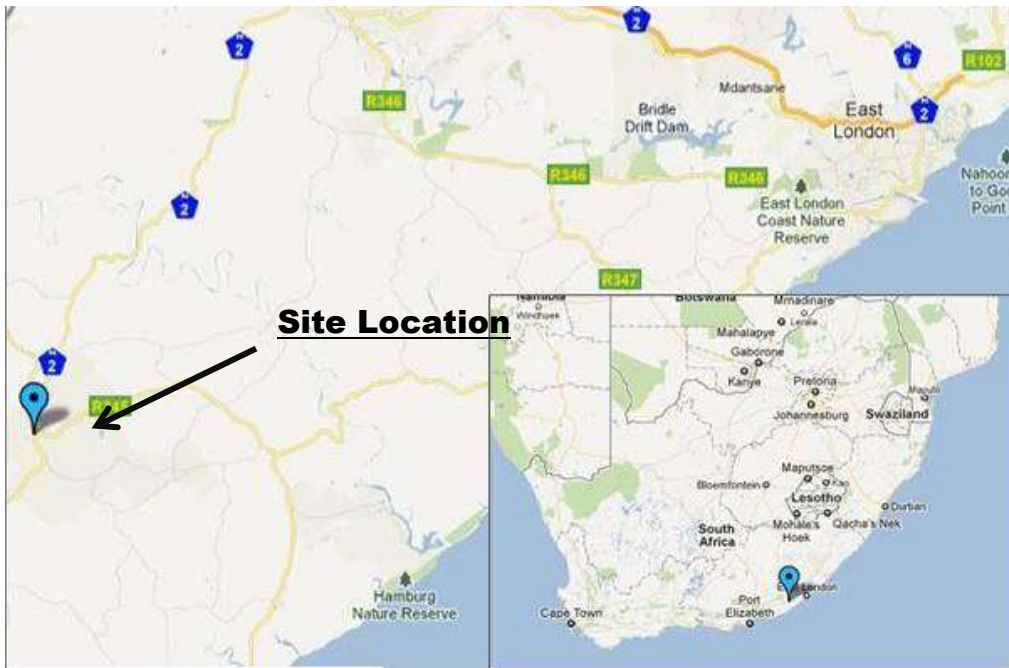


Figure 1-1: Location map for the proposed InnoWind Peddie 10MW Solar PV Facility

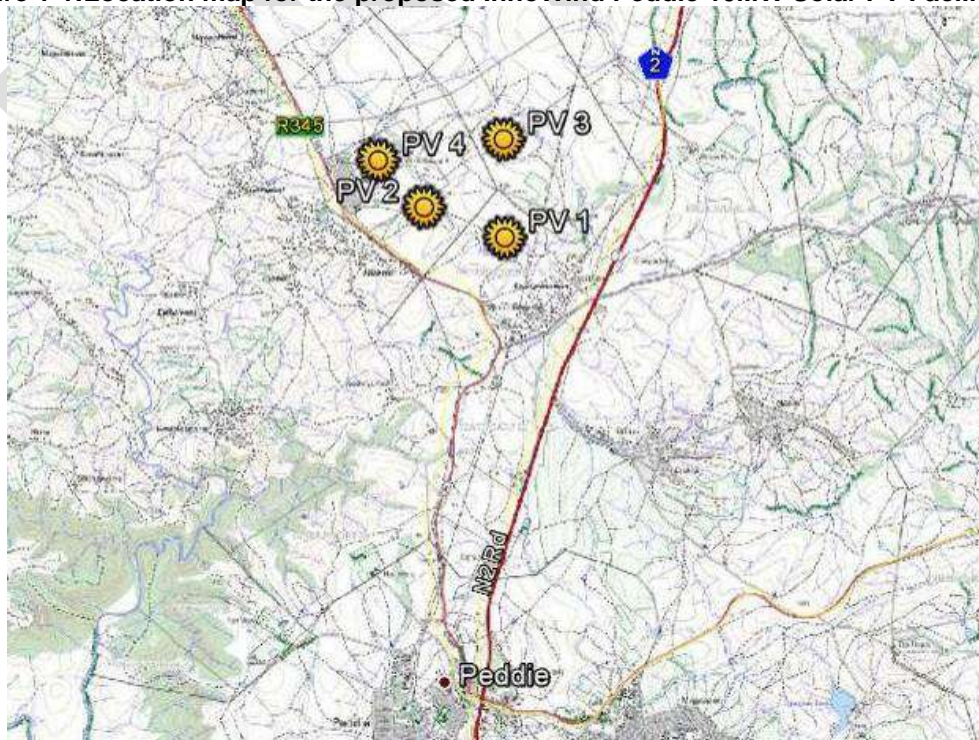


Figure 1-2: Map show the locations of the 4 potential sites assessed for the proposed

Peddie 10 MW solar PV facility relative to Peddie to the south.

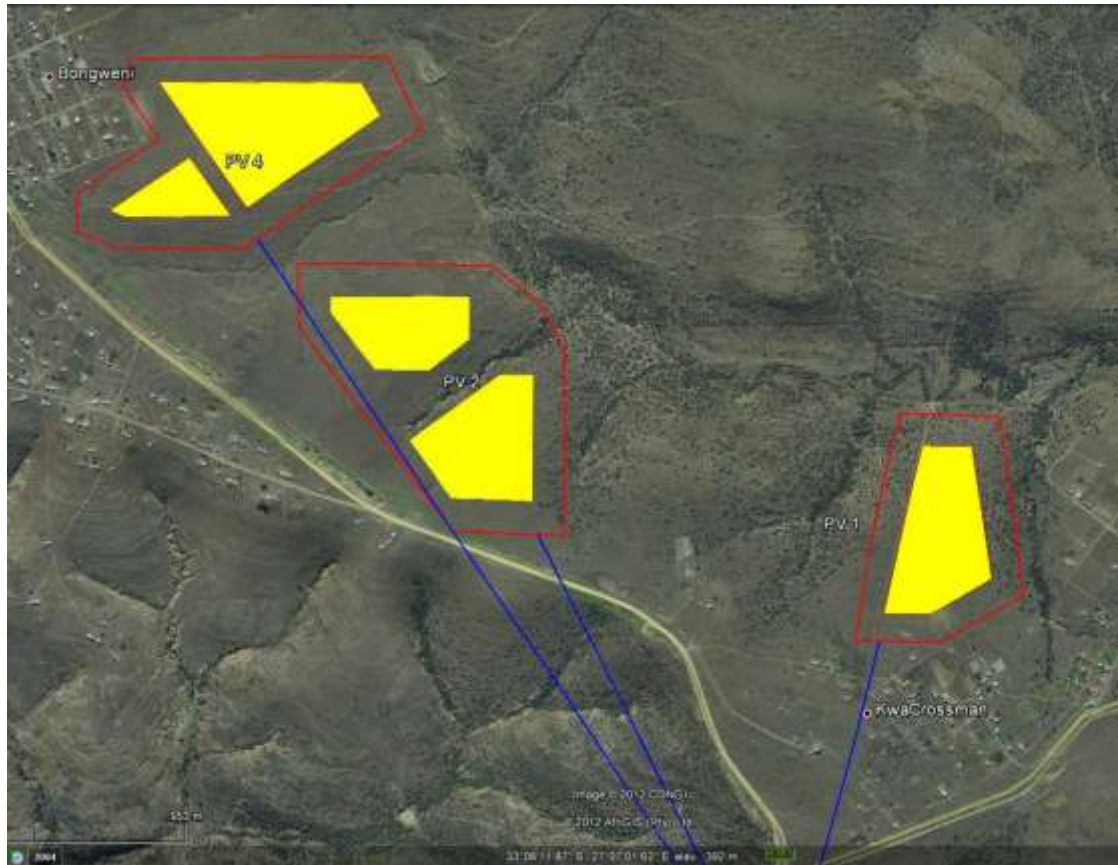


Figure 1-3 Google image showing the location of the 3 preferred PV sites assessed for the proposed Peddie 10 MW solar PV facility.

DESCRIPTION OF THE PROPOSED PV PROJECT

The proposed Peddie 10 MW solar PV facility will be built in a single phase which can take up to six months to construct. The power generation facility will be made up of PV modules laid out in rows or arrays.

Arrays

It is useful to understand the makeup of a photovoltaic array, and the terminology that is used to describe each component of an array. Figure 1-4 and Figure 1-5 illustrate that an array consists of PV panels, which are made up of individual modules, which are in turn comprised of PV cells.

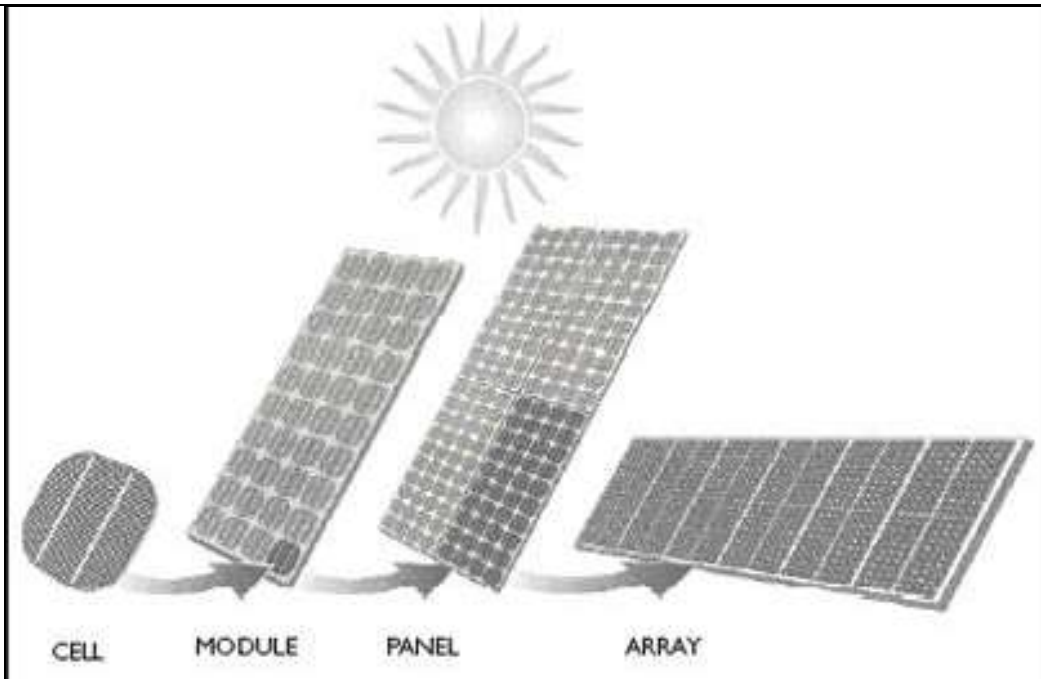


Figure 1-4: Schematic description of the makeup of a photovoltaic array.



Figure 1-5: Photograph showing the makeup of a photovoltaic array.

The InnoWind PV facility will consist of about 10 arrays of about 1.7 Ha each, covering a total area of about 17 Ha (excluding ancillary infrastructure).

Each array will be raised above the ground and fixed to frames to slope toward the sun in the north at an approximate 45 degree angle to the horizontal. Each of the arrays will be placed in a series with a gap of about 5.0 metres between each row.

Photovoltaic modules

An individual PV module is made of layers of polycrystalline silicone, which act as a semi-conductor. When radiation from the sun falls on a PV cell it creates an electric field across a series of thin metallic layers, causing electricity to flow. Higher solar radiation levels will increase the flow of electricity. This charge is discharged via the module's transparent conductive front layer and metallic rear layer. The direct current generated within the module is fed into the electrical grid via an inverter (Figure 1-6).

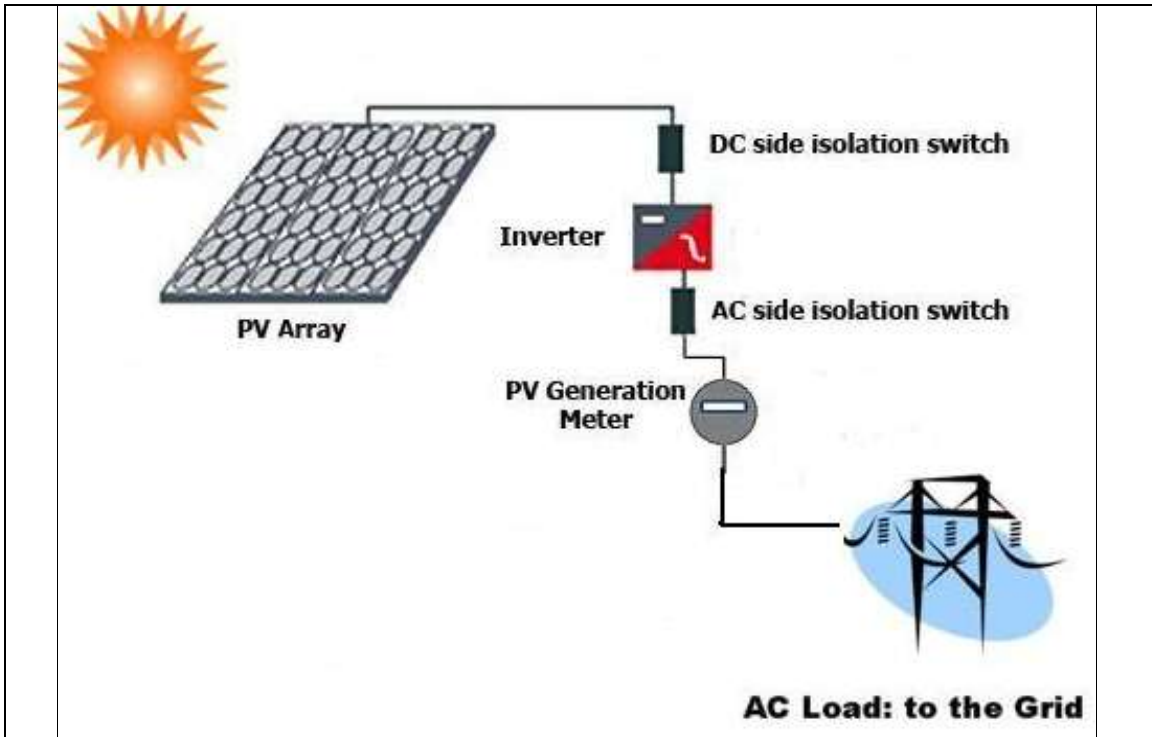


Figure 1-6: Schematic showing solar energy capture and electricity generation

The proposed thin-film PV modules are about 2.0 m² (1.0 m x 2.0 m) in size, and comprise four panels. Each module is mounted on a metal supporting structure, no more than 1.0 metre off the ground, and has a potential output of 380 Watts. There are a number of options regarding the structures and their anchoring to the ground. Typically this is done by means of a small concrete “foot” at the base of the pole supporting the structure.

Modules will be organized into 10 arrays of 1.0 MW (approximately 1.7 ha), with each group connected to a “group station” (a cabin of approximately 2.5 x 4 m containing transformers and inverters).

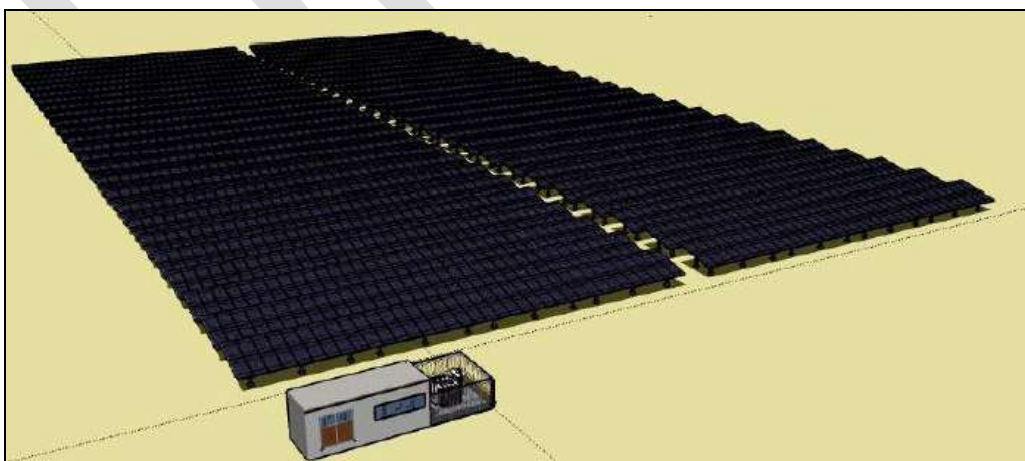


Figure 1-7: A solar array and group station showing the typical layout of the structures



Figure 1-8: View of a Solar PV array

Each “group station” is then connected with a “main station” of approximately the same size, which is connected to the closest substation, in the case of the Peddie PV Facility; this will be to the Eskom Substation, via an XX kV power line. It is expected that the PV installation would have a total of about 10 “group stations” and a single “main station”.



Figure 1-9: Example of a solar PV facility consisting of 12 arrays. similar size to the 10 MW facility proposed for Peddie

It is also proposed that the PV facility be fenced for security reasons. A small control cabin will be built at the entrance to the solar facility.

Roads

Roads will consist of single track gravel roads consisting of a total length of about 200 m. The roads will be used as access to service and maintain the solar structures.



Figure 1-10: Photos showing the type of proposed internal road structure

Electrical infrastructure

Solar generated electricity will link up to a group station. It is expected that about 10 group stations will service the 10 MW solar facility, with each station occupying a surface area of 10.0 m². The group stations will therefore cover a total area of 100 m². All electricity cables will be located underground and link the group stations to a single main station onsite (10 m² footprint). From there it will be distributed to the Eskom Substation to link up with the electricity grid.

Construction phase

(a) Conduct surveys

Prior to construction, surveys such as, but not limited to, geotechnical, site surveys and confirmation of PV array micro-sighting, road servitudes, etc. will be conducted.

(b) Establish access roads

Access to site will be *via* the N2 to Peddie and the gravel R345 between Peddie and the site. Within the site itself, access will be required from the existing roads to the individual facility components for construction purposes.

(c) Site preparation

This will include clearance of vegetation for the “footings” of each array component only. These activities will require some stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site. In addition, some limited contouring may be necessary.

(d) Establishment of lay down areas

Lay down and storage areas will be required for the construction equipment required on site.

(e) Construction camp

An area for establishment of an onsite construction camp will be required. Establishing the construction camp will require the clearing of vegetation and levelling of the demarcated development site.

(f) Establishment of ancillary infrastructure

The establishment of these facilities/buildings will require the clearing of vegetation and levelling of the development site and the excavation of foundations prior to construction. A lay down area for building materials and equipment associated with these buildings will also be required.

(g) Undertake site remediation

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

Operation phase

The electricity that is generated from the PV modules will be stepped up through the onsite transformers. Thereafter the power will be fed to the Eskom substation via an XXX kV overhead or underground power lines.

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

Maintenance is mainly mechanical and electrical. Maintenance will entail replacement of old and used PV panels. Maintenance will also entail ground maintenance, i.e. cutting/mowing of grass and related activities. Cleaning of the PV panels would be undertaken using a vehicle-based compressor and a wash down with water once or twice annually, as required. Water usage will be minimal.

Decommissioning phase

The PV is expected to have a lifespan of approximately 30 years (with maintenance). The infrastructure would only be decommissioned once it has reached the end of its economic life. If economically feasible, the activities would comprise the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at the time. However, if not deemed so, then the facility would be completely decommissioned which would include the following decommissioning activities.

(a) Disassemble and replace existing components

The components would be disassembled and reused and recycled or disposed of in accordance with regulatory requirements.

BIOPHYSICAL ENVIRONMENT

PHYSICAL ENVIRONMENT

Climate

The average rainfall in the Peddie area is about 717 mm. Average temperatures are 17 °C with infrequent winter frost. Mean monthly maximum and minimum temperatures for Peddie are 35 °C and 1.6 °C for February and June respectively.

Topography

The proposed site is characterised by flat land with gently to moderately undulating landscapes and dissected hilltop slopes. The land is used mostly for informal grazing of livestock such as cattle, sheep and goats.



Figure 1-11: Typical views of the location of the PV facility showing the nature of the topography.

Geology

The area consists of mudstones with subordinate sandstone of the Adelaide Subgroup of the Beaufort Group of the Karoo Super group, underlying most of the area and is intruded by Karoo dolerite dykes and sills.

BIOLOGICAL ENVIRONMENT

See Ecological Assessment at Appendix D-2.

Vegetation

The PV layouts are situated predominantly in a vegetation type named “Great Fish Thicket” (Figure 1-12 below) in terms of the SANBI Vegetation map for the area (Mucina and Rutherford, 2006). A small corner section of Alternative PV2 has been described as “Bhisho Thornveld”, but the difference in vegetation was not visually apparent.



Figure 1-12: SANBI Vegetation map of the region the red polygons represents the PV sites.

Great Fish Thicket (Hoare et al., 2006)

This Thicket type are found on steep slopes of deeply dissected rivers and supports short, medium and long thicket types where both the woody trees and shrubs and the succulent components are well developed. Spinescent shrubs are common. Dominant species are *Euphorbia bothae*, *E. tetragona* and *E. triangulates*. These conditions were not present at the site in question. Slopes associated with the PV sites were relatively gentle, covered by grasslands.

Bhisho Thornveld (Rutherford et al., 2006)

This open savanna is characterised by small trees of *Acacia natalitia* with a short to medium, dense and sour grassy understorey which is usually dominated by *Themeda triandra* and are mostly found on undulating steep slopes and sometimes in drainage valleys. The conservation status of Bhisho Thornveld is “Least Threatened”. This vegetation description is better suited to environmental conditions observed at both PV2 and PV4 sites.





Figure 1-13: Typical short grass vegetation species due to grazing pressures found on the proposed site

CONSERVATION STATUS

Subtropical Thicket Ecosystem Programme (STEP)

The STEP Conservation Priority Map classifies areas into a number of categories, based on plant and animal biodiversity of the planning domain, with emphasis on Thicket biomes (Pierce, 2003). The Conservation Priority map for the study area is presented in Figure 1-14. Most of the study area is classified as a STEP “Class IV” area. The land-use management guidelines for (Table taken from STEP) classified as a Class IV (currently not vulnerable) area requires that these areas can withstand a loss off or disturbance of natural areas through human activity or development. Most of the area shown in Alternative site PV4 are also considered as degraded.

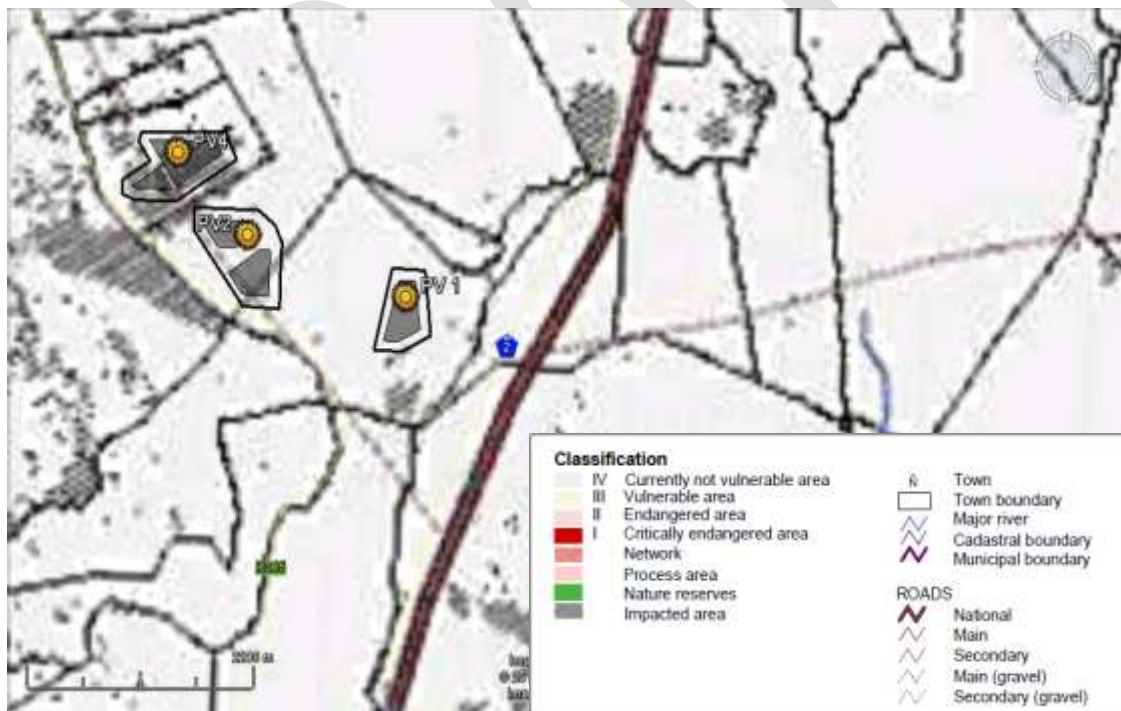


Figure 1-14: STEP Conservation Priority Map.

Eastern Cape Biodiversity Conservation Plan (ECBCP)

The ECBCP is a first attempt at detailed, low-level conservation mapping for land-use planning purposes. Specifically, the aims of the Plan were to map critical biodiversity areas through a systematic conservation planning process. The current biodiversity plan includes the mapping of priority aquatic features, land-use pressures, critical

biodiversity areas and develops guidelines for land and resource-use planning and decision-making.

The main outputs of the ECBCP are “critical biodiversity areas” or CBAs, which are allocated the following management categories:

- CBA 1 = Maintain in a natural state
- CBA 2 = Maintain in a near-natural state

The ECBCP maps CBAs based on extensive biological data and input from key stakeholders. The ECBCP, although mapped at a finer scale than the National Spatial Biodiversity Assessment (Driver et al., 2005) is still, for the large part, inaccurate and “course”. Therefore it is imperative that the status of the environment, for any proposed development MUST first be verified before the management recommendations associated with the ECBCP are considered (Berliner and Desmet, 2007). It is also important to note that in absence of any other biodiversity plan, the ECBCP has been adopted by the Provincial Department of Economic Development and Environmental Affairs as a strategic biodiversity plan for the Eastern Cape.

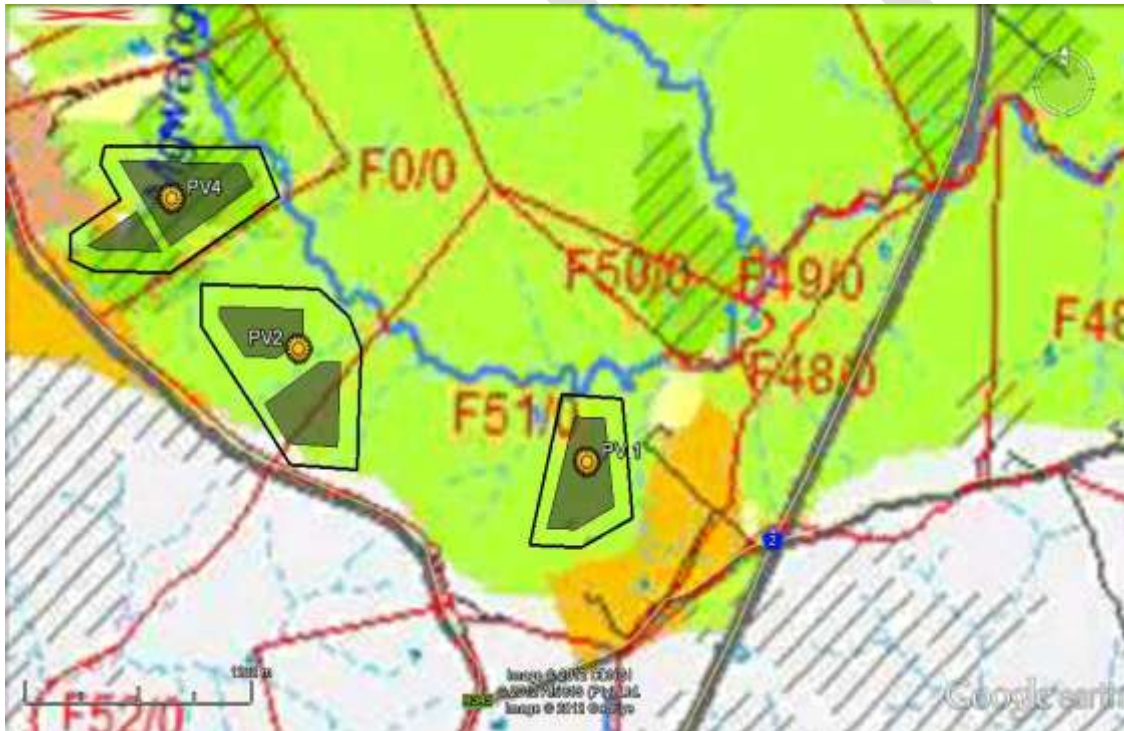


Figure 1-15: ECBCP map of the surrounding area

The ECBCP map (Figure 1-15) for the area shows that most of the surrounding landform is categorised as a CBA 2 area, which requires that the land is maintained in a near natural state. As most of the surrounding areas are extremely degraded through years of cattle grazing, this status classification is not valid.

CURRENT LAND-USE AND GENERAL STATE OF ENVIRONMENT

Alternative PV1

The study site and neighbouring properties in the area are currently engaged with livestock farming (Figure 1.16 & 1.17). The site is bordered by the village of KwaCrossman in the south and Buckman in the east. The vegetation is in poor

condition (because of informal stock grazing).



Figure 1.16: The affected area consists of degraded grassland interspersed with *Acacia natalitia*.

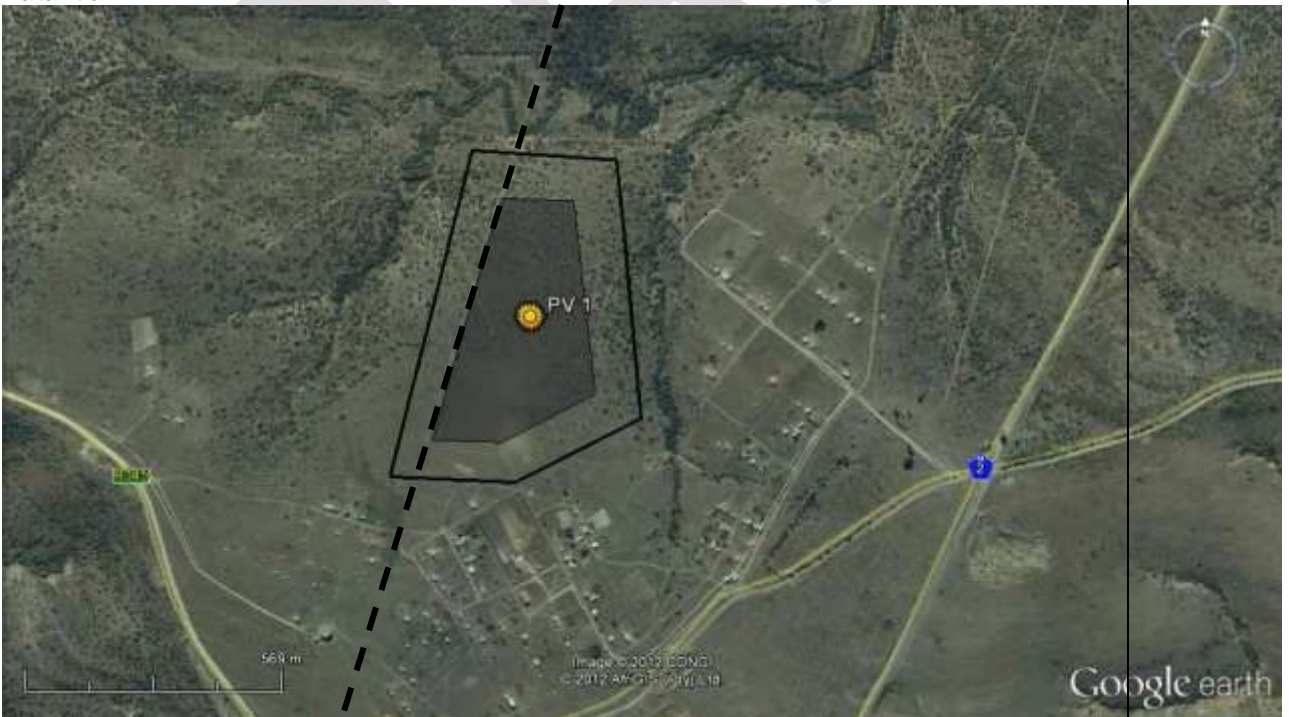


Figure 1.17: An aerial photo shows denser tree vegetation in the surrounding drainage systems. The shaded polygons represent the solar panel's footprint. The dashed line represents the existing power line layout.

Alternative PV2

The study site and neighbouring properties in the area are currently engaged with livestock farming (Plate 1-18 & 1-19). The vegetation in poor condition in some places (where there is informal stock grazing) and moderate in the north-eastern areas of the property.



Figure 1-18: The affected area consists of degraded grassland in the flat areas and Acacia karroo rich valley thicket in the drainage system.



Figure 1-19: An aerial photo shows the trees rich drainage system. The yellow polygons represent the solar panel's footprint. The dashed line represents the existing power line layout.

Alternative PV4

The study site and neighbouring properties in the area are currently engaged with livestock farming (Figure 1-20 & 1-21). The site is bordered by the village of Bongweni in the west. The vegetation is in poor condition (because of informal stock grazing).



Figure 1-20: The village of Bongweni that borders the proposed site on the west. The affected area consists of degraded grassland.

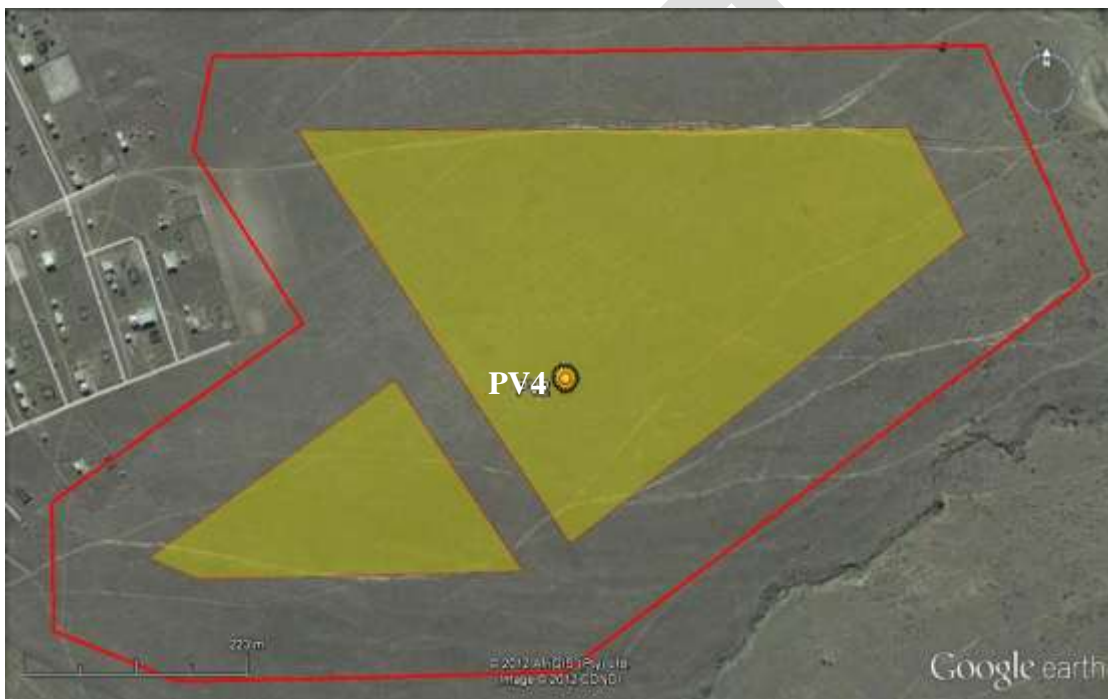


Figure 1-21: An aerial photo shows the surrounding degraded grassland with Bongweni bordering on the west. The yellow polygons represent the solar panel's footprint.

Power line

The proposed site alternatives will connect to the Peddie substation to the south-east along an existing servitude where possible (see Figure 1-22 below).

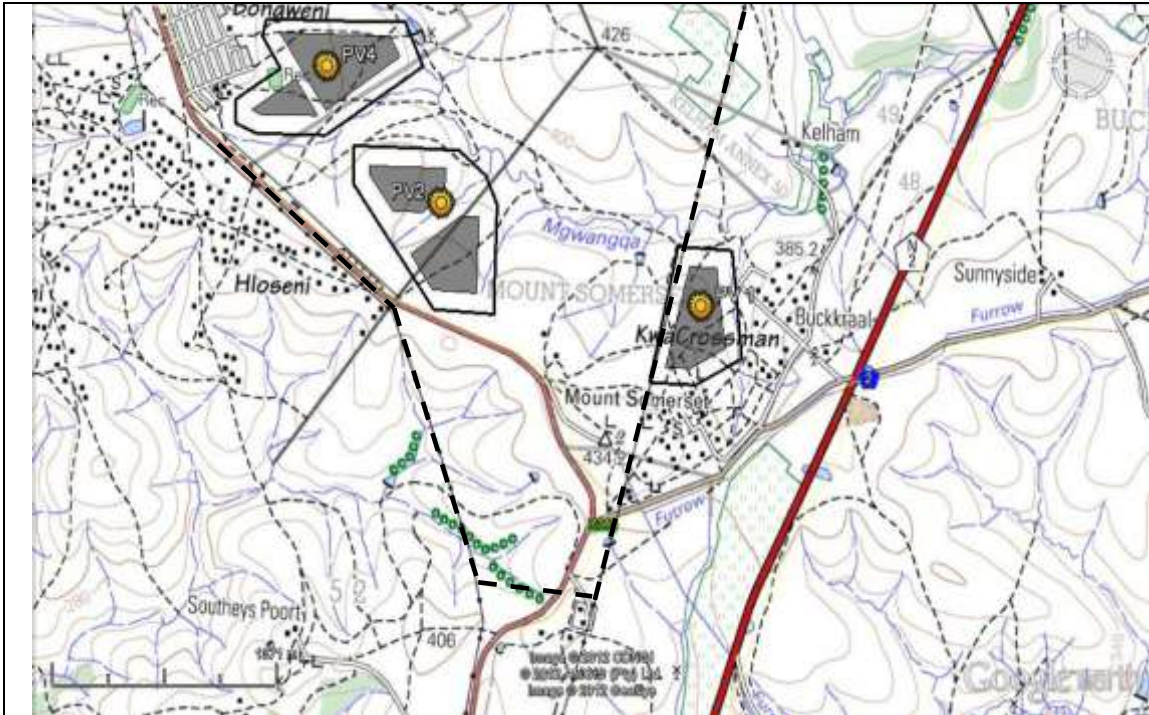


Figure 1-22: Location of the existing power line outside the proposed alternative sites (dashed line)

BIODIVERSITY

A site assessment was conducted in order to confirm desktop information and infer accurate descriptions of the current ecological integrity of the site at a more detailed level. A further objective is to assist in impact identification and assessment. This study discusses fauna, flora and potential sensitive ecosystems.

Fauna

Small mammals such as rodents, ground squirrels, bats and a variety of insects and reptiles are expected to occur on site. The development may cause a shift in faunal community as shade-loving plant species establish beneath the panels. It is envisaged that no significant negative impact may be experienced as a result of the panels, as they may form refugia for many animals (including birds and rodents), whilst maintaining natural grassland.

Flora

The study area includes the impacted footprint of the development and surrounding areas. The vegetation can be described as degraded grassland that typically consists of graminoids and herbaceous shrubs. A few geophytic species were observed, but undetected species, not flowering at the time nor producing above-ground stems or leaves, are expected to occur. Valley thicket is found in the drainage areas and it is historically known that the entire area was traditionally thicket vegetation that became degraded through domestic animal grazing practises.

The plant species identified have been grouped in Table 1-1 below.

Table 1-1: Plant species identified in the study area. * = species of special concern/protected

Graminoids	*
<i>Aristida congesta</i>	
<i>Cynodon incompletus</i>	
<i>Digitaria eriantha</i>	
<i>Eragrostis obtuse</i>	
<i>Panicum species</i>	
<i>Themeda triandra</i>	
<i>Eragrostis species</i>	
Herbs and Geophytes	
<i>Cyanotis speciosa</i>	
<i>Hypoestes aristata</i>	
<i>Salvia scabra</i>	
<i>Aizoon glinoides</i>	
<i>Hibiscus pusillus</i>	
<i>Crassula expanza</i>	
<i>Senecio radicans</i>	
<i>Sanseviera hyancinthoides</i>	

DRAFT

2. FEASIBLE AND REASONABLE ALTERNATIVES

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

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

2(A) SITE ALTERNATIVES:

Describe site alternative 1 (S1), for the activity described above, or for any other activity alternative:

Site 1 – Also referred to as PV 1 – Preferred site

PREFERRED SITE

PV1 is located closest to the N2, and immediately northwest of KwaCrossman village. The portion of the site closest to the village is preferred to the section on the opposite side of the valley. Only portion A of PV1 was considered to be one of the three **preferred sites**.



Describe site alternative 2 (S2), if any, for the activity described above, or for any other activity alternative:

Site 2 – Also referred to as PV 2 – Preferred site

PREFERRED SITE

PV2 is located north of the R345 between PV1 and PV4. This site was considered to be one of the three **preferred sites**.



Describe site alternative 3 (S3), if any, for the activity described above, or for any other activity alternative:

Site 3 – Also referred to as PV 3

EXCLUDED

PV3 was excluded from further assessment as the site was deemed to be unsuitable for a PV facility as it is inaccessible and removal or disturbance of the sensitive environment could not be justified for the purpose of establishing a PV facility.



Describe site alternative 4 (43), if any, for the activity described above, or for any other activity alternative:

Site 4 – Also referred to as PV 4

PREFERRED SITE

PV4 is located north of the R345 close to the Bongweni village to the north west, and also located north west of PV2 and PV4. This site was considered to be one of the three preferred sites.



Describe site alternative 5 (S5), if any, for the activity described above, or for any other activity alternative:

No-Go alternative under which no development takes place and the proposed site remains in its current state, that is, informal livestock grazing.

(2)(B) ACTIVITY ALTERNATIVES:

Describe activity alternative 2 (A2), if any, for any or all of the site alternatives as appropriate:

Activities include the laying down of up to 10 x 1MW arrays, each connected to a “group station” (a cabin of approximately 2.5 x 4 m containing transformers and inverters) and the upgrading and/or establishment of gravel access roads with a width 6m or less within the site.

Describe activity alternative 2 (A2), if any, for any or all of the site alternatives as appropriate:

NONE

Describe activity alternative 2 (A2), if any, for any or all of the site alternatives as appropriate:

NONE

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

3. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

List alternative sites if applicable.

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 (PV1A)	33°08'21.80"S	27°07'38.10"E
Alternative S2 ¹ (PV2)	33°08'09.86"S	27°06'48.48"E
Alternative S3 (PV4)	33°07'47.91"S	27°06'17.20"E

In the case of linear activities: N/A

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 (preferred or only route alternative)		
• Starting point of the activity	0	€
• Middle point of the activity	0	€
• End point of the activity	0	€
Alternative S2 (if any)		
• Starting point of the activity	0	€
• Middle point of the activity	0	€
• End point of the activity	0	€
Alternative S3 (if any)		
• Starting point of the activity	0	€
• Middle point of the activity	0	€
• End point of the activity	0	€

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

4. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:	Size of the activity:
Alternative A1	11 ha
Alternative A2 (if any)	19 ha
Alternative A3 (if any)	19 ha

¹ "Alternative S.." refer to site alternatives.

or, for linear activities:

Alternative:

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

Length of the activity:

NA
NA
NA

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

Alternative:

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

Size of the site/servitude:

15 000m ²
20 000m ²
20 000m ²

5. SITE ACCESS

Does ready access to the site exist?

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

YES	NO
NA	

Describe the type of access road planned:

Access to the site is *via* the N2 which runs from King William's Town to Peddie, and then the R345 from Peddie travelling in a north westerly direction. Within the site itself, roads with a width of 6 metres will be constructed for larger vehicles and smaller paths less than 4 metres will be required to the individual facility components for construction purposes (and later limited access for maintenance).

Where appropriate, internal roads will be limited to permeable concrete blocks as shown below.



Figure 5-1: Proposed internal road structure

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

6. SITE OR ROUTE PLAN

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

The site or route plans must indicate the following:

- 6.1 the scale of the plan which must be at least a scale of 1:500;
- 6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
- 6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 6.4 the exact position of each element of the application as well as any other structures on the site;
- 6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 all trees and shrubs taller than 1.8 metres;
- 6.7 walls and fencing including details of the height and construction material;
- 6.8 servitudes indicating the purpose of the servitude;
- 6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
 - rivers;
 - the 1:100 year flood line (where available or where it is required by DWA);
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 6.9 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 6.10 the positions from where photographs of the site were taken.

7. SITE PHOTOGRAPHS

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

8. FACILITY ILLUSTRATION

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

9. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

- What is the expected capital value of the activity on completion?
- What is the expected yearly income that will be generated by or as a result of the activity?
- Will the activity contribute to service infrastructure?
- Is the activity a public amenity?
- How many new employment opportunities will be created in the development phase of the activity?
- What is the expected value of the employment opportunities during the development phase?
- What percentage of this will accrue to previously disadvantaged individuals?
- How many permanent new employment opportunities will be created during the operational phase of the activity?
- What is the expected current value of the employment opportunities during the first 10 years?
- What percentage of this will accrue to previously disadvantaged individuals?

R40 million	
Not Determined	
YES	NO
YES	NO
50	
R4.8 million	
85%	
20	
R19.2 million	
85%	

9(b) Need and desirability of the activity

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

DESIRABILITY:			
1.	Does the proposed land use / development fit the surrounding area?	YES	NO
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	YES	NO
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES	NO
4.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation: NA – but the proposal is consistent with the Amathole District Municipality’s Climate Change and Renewable Energy Strategies and the objectives of the Peddie Local SDF and Nqgushwa LM Master Plan. The project will elevate the community’s technical skills and knowledge relating to alternative and renewable energy technologies and opportunities.		
5.	Will the proposed land use / development impact on the sense of place?	YES	NO
6.	Will the proposed land use / development set a precedent?	YES	NO
7.	Will any person’s rights be affected by the proposed land use / development?	YES	NO
8.	Will the proposed land use / development compromise the “urban edge”?	YES	NO
9.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation. NA		

BENEFITS:			
1.	Will the land use / development have any benefits for society in general?	YES	NO
2.	<p>Explain:</p> <p>The proposed PV system is considered to be of provincial and local strategic importance in anticipation of its contribution to electricity supply and reduced reliance on fossil energy sources. The South African Government has recognised the country's high level of renewable energy potential and presently has in place targets of 10 000 GWh of renewable energy by 2013 (to be produced mainly from biomass, wind, solar and small-scale hydro). This amounts to ~4% (1 667 MW) of the total estimated electricity demand (41 539 MW) by 2013.</p> <p>The proposed project also represents a significant contribution to climate change mitigation in the Eastern Cape and Amathole DM.</p> <p>Electricity supply Over the last few years, South Africa has been adversely impacted by interruptions in the supply of electricity. The creation of a 'decentralised' power generation facility (i.e. not located in the traditionally centralised power producing regions of the Republic of South Africa) next to the town it proposes to supply, will secure a supplementary energy source for the area, especially during cold fronts and during the winter season when consumption is higher and wind yields are higher.</p> <p>Green energy Growing concerns such as climate change and the on-going exploitation of non-renewable resources have prompted increased international pressure on countries to increase their share of renewable energy generation. The South African government has recognized the country's high level of renewable energy potential and has placed targets of 10 000 GWh of renewable energy by 2013.</p> <p>Eastern Cape Renewable Energy Strategy The Eastern Cape Government is exploring alternative energy supply such as wind, solar and hydroelectricity. The province is committed to a minimum of 2% of energy supply from Renewable Energy by 2025.</p> <p>Climate change The electricity generated by the wind farm and photo-voltaic panels will displace some fossil fuel based forms of electricity generation. The photovoltaic, over its lifetime, will therefore avoid the production of a sizeable amount of CO₂, SO₂ and NO₂ that would otherwise be emitted to the atmosphere.</p> <p>Clean Development Mechanism It is envisaged that this project will be registered as a Clean Development Mechanism (CDM) project with the United Nations Framework Convention on Climate Change as a greenhouse gas emissions project with the intention of promoting sustainable local development.</p>		
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES	NO
4.	Explain:		

	The development will aid in the creation of jobs during the construction phase. During project development, skills development and transfer will be one of the top priorities and local community involvement will be enhanced as far as possible. It is envisioned that local SMMEs will benefit from opportunities to supply components of the PV arrays.
--	---

10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administering authority:	Date:
National Environmental Management Act (No. 107) as amended in 2008	DEA& DEDEA	1998
NEM: Biodiversity Act (No. 10 of 2004)	DEA& DEDEA	2004
National Heritage Resources Act (NHRA) No 25 of 1999	SAHRA	1999
NEM: Air Quality Act (No. 39 of 2004)	DEA & DEDEA	2004
National Forest Act (NFAA) No. 84 of 1998	DAFF: Forestry	1998
Electricity Regulation Act (No 4 of 2006)	Dept of Energy	2006
Conservation of Agricultural Resources Act (43 of 1983)	Dept of Agriculture	1983
Occupational Health and Safety Act (No. 85 of 1993)	Dept of Labour	1993
The White Paper on Energy Policy for South Africa	DME	2007
White Paper on Renewable Energy Policy	DME	2008
Eastern Cape Renewable Energy Strategy	DEDEA	2010/12
Green paper – SA Climate Change Response	DEA	2010
Municipal By-laws	NA	

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

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

YES	NO
-----	----

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

Less than 10m ³

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

The volume of waste produced during the construction phase is minimal and will consist mostly of paper, plastic and empty cement bags. The waste will be collected and disposed of at the nearest registered landfill site, which is currently King William's Town about 40 km to the north.

The inappropriate handling and disposal of solid waste materials can impact on both human safety and risk contamination of the natural environment. The general waste management principles of prevent, minimise, recycle or re-use, with disposal as a last option will apply. Only permitted and registered landfills will be considered as options for disposal of waste. The following principles will guide the construction phase process and are included in the Environmental Management Programme (EMPr).

- Construction waste will be recycled or re-used in the construction process, where possible.
- Waste that cannot be re-used or recycled will be disposed of at the nearest appropriate and licensed waste disposal site - disposal records will be kept.
- Waste will not be buried and/or burnt on site.
- Where waste is to be transported by truck, it will be covered appropriately.

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

Closest registered solid waste disposal site, the King William's Town, 40 away along the N2 north towards East London.

Will the activity produce solid waste during its operational phase?	YES	NO
If yes, what estimated quantity will be produced per month?	5 m ³	

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

Damaged and used PV cells will be characterised and transported in appropriately covered vehicles to be disposed of at an appropriate waste site as necessary.

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

The waste will be collected and disposed of at the nearest registered landfill site, which is currently King William's Town.

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

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO
-----	----

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
-----	----

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

11(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
-----	----

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

--	--

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES	NO
-----	----

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

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO
-----	----

If yes, provide the particulars of the facility:

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

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

N/A

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO
-----	----

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

YES	NO
-----	----

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

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

Nuisance dust may be generated in the construction of the access roads within the site. This will be most keenly felt during the construction phase, after which, dust generation on site will be minimal.
--

11(d) Generation of noise

Will the activity generate noise?

YES	NO
-----	----

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

YES	NO
-----	----

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

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

N/A

12. WATER USE

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

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water
-----------	-------------	-------------	----------------------------	-------	--

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

YES	NO

Does the activity require a water use permit from the Department of Water Affairs?

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

13. ENERGY EFFICIENCY

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

The design and layout of the PV panels is such that the PV arrays will capture the maximum amount of light for the production of electricity. The PV array will be arranged in rows with spacing of 4-5 metres between each row and tilted at an angle to the horizontal. Energy generated will be linked directly to the Eskom substation for connection onto the local grid via an overhead or underground **XXX** kV power line.

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

As the proposed PV system is itself an alternative energy source, it does not require alternative energy sources.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section?

YES	NO
-----	----

If YES, please complete the form entitled "Details of specialist and declaration of interest"

for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

Property description/physical address:

Communal land owned by Nqgushwa Municipality

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

N/A

Current land-use zoning:

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

Agriculture - informal grazing of livestock

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

Is a change of land-use or a consent use application required?
 Must a building plan be submitted to the local authority?

YES	NO
YES	NO

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

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

1. GRADIENT OF THE SITE

Indicate the general gradient of the sites.

Alternative S1:

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

Alternative S2:

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

Alternative S3:

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

2. LOCATION IN LANDSCAPE

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

- 2.1 Ridgeline
- 2.2 Plateau
- 2.3 Side slope of hill/mountain
- 2.4 Closed valley
- 2.5 Open valley
- 2.6 Plain
- 2.7 Undulating plain / low hills
- 2.8 Dune
- 2.9 Seafront

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

	Alternative S1:		Alternative S2:	
Shallow water table (less than 1.5m deep)	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO
An area sensitive to erosion	YES	NO	YES	NO

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

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

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

Natural veld — good condition ^E	Natural veld with scattered aliens ^E	Natural veld with heavy alien infestation ^E	Veld dominated by alien species ^E	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

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

SEE SPECIALIST ECOLOGICAL ASSESSMENT APPENDIX D-2

5. LAND USE CHARACTER OF SURROUNDING AREA

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

5.1 Natural area

5.2 Low density residential

- 5.3 Medium density residential
- 5.4 High density residential
- 5.5 Informal residential^A
- 5.6 Retail commercial & warehousing
- 5.7 Light industrial
- 5.8 Medium industrial^{AN}
- 5.9 Heavy industrial^{AN}
- 5.10 Power station
- 5.11 Office/consulting room
- 5.12 Military or police base/station/compound
- 5.13 Spoil heap or slimes dam^A
- 5.14 Quarry, sand or borrow pit
- 5.15 Dam or reservoir
- 5.16 Hospital/medical centre
- 5.17 School
- 5.18 Tertiary education facility
- 5.19 Church
- 5.20 Old age home
- 5.21 Sewage treatment plant^A
- 5.22 Train station or shunting yard^N
- 5.23 Railway line^N
- 5.24 Major road (4 lanes or more)^N
- 5.25 Airport^N
- 5.26 Harbour
- 5.27 Sport facilities
- 5.28 Golf course
- 5.29 Polo fields
- 5.30 Filling station^H
- 5.31 Landfill or waste treatment site
- 5.32 Plantation

5.33 Agriculture

5.34 River, stream or wetland

- 5.35 Nature conservation area
- 5.36 Mountain, koppie or ridge
- 5.37 Museum
- 5.38 Historical building
- 5.39 Protected Area

5.40 Graveyard

5.41 Archaeological site

- 5.42 Other land uses (describe)

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity.

NA

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

If YES, specify and explain:

If YES, specify:

NA

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

If YES, specify and explain:

If YES, specify:

NA

6. CULTURAL/HISTORICAL FEATURES

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

YES	NO

If YES, explain:

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

Briefly explain the findings of the specialist:

A heritage survey was undertaken for the proposed Peddie PV site. The area consists of long hills running in a northwest-southeast direction. These hills are currently used for pasturage for cattle and goats, while some areas have been ploughed.

A search of 1964 topographical maps indicated that there would be several potential heritage sites, including human graves, in the general area. Some of these sites were recorded during the survey. There had been no other heritage impact assessments, or archaeological assessments, within 25km of the study area.

Four heritage sites were observed during the survey, of which six require some form of mitigation. The main heritage site is an old milkwood tree that is a national monument dating to 1835. The monument is still in use by the Mfengu people who undertake annual visits to the site. The monument thus has an oral history and living heritage status attached to it as well as being of historical significance. The monument will not be visually affected by the PV sites. The historical and modern cemetery will have a visual impact. It was suggested that the areas facing the PV sites are screened with indigenous trees and bushes.

Heritage Impact Assessment Report – Appendix D-1

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

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

SECTION C: PUBLIC PARTICIPATION

NB: ALL PUBLIC PARTICIPATION CAN BE FOUND IN APPENDIX G

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;

- (b) giving written notice to—
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vii) any other party as required by the competent authority;
- (c) placing an advertisement in—
 - (i) one local newspaper; or
 - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy;
 - (ii) disability; or
 - (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
 - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
 - (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
 - (iii) the nature and location of the activity to which the application relates;

- (iv) where further information on the application or activity can be obtained; and
- (iv) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

Comments from I&AP's were collected and presented in Appendix E

6. AUTHORITY PARTICIPATION

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least 30 (thirty) calendar days before the submission of the application.

List of authorities informed:

DWA	Landile Jack	
South African Heritage Resources Agency	Mariagrazia Galimberti	
Ngqushwa Local Municipality– Integrated Environmental Management Programme		
Ward Councillor (Ward)		
Amatola District Municipality	Mr Nico Jonker – Director Engineering Services	
DEDEAT	Briant Noncembu	
DAFF		
SANRAL		

List of authorities from whom comments have been received:

To be completed once public review is complete
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7. CONSULTATION WITH OTHER STAKEHOLDERS

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

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES	NO
-----	----

If “YES”, briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

SECTION D: IMPACT ASSESSMENT

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

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

None yet received. Public review of the BAR document still to be conducted

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report):

None

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

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

ALTERNATIVE A1 (PREFERRED ALTERNATIVE)

INSERT IMPACTS TABLE AND MITIGATION SUMMARY AFTER FINAL REVIEW

3. ENVIRONMENTAL IMPACT STATEMENT

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

DRAFT

Alternative 3: Preferred alternative - PV4

DESIGN AND PLANNING PHASE								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Environmental Legal and Policy compliance - Failure to adhere to existing policies and legal obligations could lead to the project conflicting with local, provincial and national policies, legislation etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	Direct	Long term	Localised	Probable	Severe	HIGH	- The planning and design of the PV should comply with all relevant legislation and policies, e.g.: <ul style="list-style-type: none"> o Local and District Spatial Development Frameworks (i.e. Nqgushwa LM and Amathole DM) o Eastern Cape Biodiversity Conservation Plan (ECBCP) o NLM Strategic Environmental Assessment (SEA) o NLM By-laws pertaining to waste management, etc. - In addition, planning for the construction and operation of the proposed PV facility should take into account and consider any available best practice guidelines. - See Appendix J for solar assessment.	LOW
Environmental benefits There are other factors that contribute to the project's overall benefits such as: <ul style="list-style-type: none"> o The project contributes positively to climate change mitigation globally and move to renewable energy. o The project has a small footprint where only the footings of the PV panels will require ground disturbance. o After the project is terminated, perhaps some 30 years in the future, the site can be rehabilitated to its original state. 	Direct, indirect & cumulative	Long term	Localised to national	Probable	Very beneficial	HIGH POSITIVE	- NA	HIGH POSITIVE
Biodiversity planning compliance - Risk of PV layout and location of ancillary elements compromising or being inconsistent with objectives and land-use recommendations of biodiversity planning tools such as STEP and ECBCP.	Direct/ Indirect	Long term	Localised	Probable	Severe	HIGH	- Avoid laying down the PV facility on identified critically endangered biodiversity areas within the proposed site. - There must be no development within 32m of any watercourse.	MODERATE
- Risk of designing long and wide access roads that would require wide scale vegetation stripping on site thereby compromising local biodiversity.	Direct/ Indirect/	Long term	Localised	Possible	Moderately severe	MODERATE	- It is strongly recommended that internal roads should comprise strip roads to maintain ecosystem integrity as much as possible. - Strip roads should not be tarred and should make appropriate use of concrete blocks. - Limit the number of strip roads on site to minimise their overall footprint.	LOW
Loss of indigenous vegetation Unnecessary damage and disturbance to natural vegetation (Fish River Thicket) due to poor planning and placement of infrastructure. Refer specialist ecological assessment at Appendix D-2	Direct	Short term	Localised	Definite	Moderately severe	MODERATE	An Environmental Control Officer must be incorporated into the detailed planning and design of access roads and associated infrastructure in order to minimise the disturbance of natural vegetation for the development of the solar facility. <ul style="list-style-type: none"> - All species of special concern, protected or vulnerable must be avoided or transplanted - Rehabilitation with grasses found on site, in addition to local shade-loving grasses, must be undertaken 	LOW
Soil erosion and sedimentation Consistent, high impact water fall from the PV panels will result in direct soil erosion impacts below each panel. Refer specialist ecological assessment at Appendix D-2	Direct	Long term	Localised	Probable	Severe	HIGH	<ul style="list-style-type: none"> - Rainwater run-off must be captured and released through lower energy mechanisms. - Rainwater harvesting could be considered - Guttering and localise energy dissipation mechanisms could be implemented - Develop and implement an Erosion Action Programme. 	MODERATE
Erosion beneath each panel may result in abrasive run-off storm water, which will continue to erode the soil between and downstream of the PV panels. Refer specialist ecological assessment at Appendix D-2	Direct	Long term	Study area	Probable	Moderately severe	HIGH		MODERATE
Large scale erosion will result in high storm water run-off containing a high sediment load. This will cause sedimentation in dams and downstream wetlands. Refer specialist ecological assessment at Appendix D-2	Indirect	Downstream	Long-term	Probable	Moderately severe	HIGH		MODERATE

DESIGN AND PLANNING PHASE								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Disturbance of sensitive areas Erosion and degradation of water-courses and associated habitats due to poor planning and layout design (i.e. inappropriate utilisation of sensitive aquatic systems) Refer specialist ecological assessment at Appendix D-2	Direct	Long term	Study area	Possible	Moderately severe	HIGH	<ul style="list-style-type: none"> Ensure that a buffer zone of 32 metres is maintained. No development activities may occur within this area. Water courses should be rehabilitated by careful removal of the alien invasive vegetation. 	LOW
Landscape & visual - Design and sighting of the PV arrays could result in an alteration of the landscape character and sense of place.	Direct/ Indirect/ Cumulative	Long term	Localised	Probable	Moderately severe	MODERATE	- The PV facility should be designed to minimise visual intrusion. Planning for the layout of the PV facility should ensure that the impact of PV cell reflections on the receiving environment, including on people in the vicinity, that is, neighbouring communities at Bongweni and eLalini, is minimized. REFER TO STUDY AT APPENDIX J	MODERATE
- PV cells may reflect sunlight at certain times of the day, resulting in glare.							- The project developer <u>must</u> where feasible, use panels that minimise light reflection REFER TO STUDY AT APPENDIX J	
Visual impacts associated with PV4 - Visibility of PV4 from neighbouring villages such as Bongweni (north west), eLalini (south west) and kwaCrossman (east), and R345 road to the south and south east - Visual sensitivity of PV4 site - Visibility of PV4 panels from a distance Refer to specialist visual impact assessment at Appendix D-3	Direct and cumulative	Long term	Localised	MODERATE Where scenic and cultural resources are affected to a limited extent	PROBABLE	MEDIUM Where it should have an influence on the decision unless it is mitigated	Implement visual impact mitigatory measures as indicated at concluding section:	LOW
Reflectivity of PV panels may be problematic to aircraft and villages Refer to specialist visual impact assessment at Appendix D-3	Direct	Long term	Localised	LOW Where non-reflective PV panels employed	UNLIKELY	LOW Where non-reflective PV panels employed	Employ non-reflective PV panels	LOW
Cultural heritage & archaeology - Risk of laying down the solar energy facility over undiscovered important archaeological and/or paleontological resources. The facility could also potentially lead to destruction of heritage resources, e.g. old graves that may be present on site.	Direct/ Indirect	Medium - Long term	Localised	Possible	Slight	LOW	- See SAHRA ASSESSMENT at APPENDIX D-1	LOW
Bulk services <u>Roads</u> - Inappropriate planning for road construction can increase the risk of surface water run-off, loss of biodiversity, soil erosion etc.	Direct/ Indirect	Medium term	Localised	Possible	Moderately severe	MODERATE	- It is recommended that strip access roads should be used to maintain ecosystem integrity as much as possible. - Strip roads should not be tarred but should make use of concrete blocks. - Limit the number of strip roads on site to minimise their overall footprint.	LOW
<u>Storm water</u> - Risk associated with inappropriate planning for storm water management e.g. design of the arrays could affect drainage and surface water run-off into the man made ditch on site	Direct/ Indirect/ Cumulative	Medium term	Localised	Possible	Moderately severe	MODERATE	- Develop and implement a storm water management plan	LOW
<u>Sewage</u> - Risk associated with leakage of sewage into the nearby watercourses from installed septic tank and soak-away sewage system, or alternative chemical toilet system.	Direct/ Indirect/ Cumulative	Medium term	Localised	Possible	Slight	LOW	- Although limited in scale, 1 septic tanks or other sanitation system must be located well away (at least 50 metres) from any water course or drainage line.	LOW
Socio-economic - The development will restrict access to the site and lead to a loss of grazing land for individuals utilising it as commonage. The site is grazed by a significant number of cattle of approximating 50 livestock units.	Direct	Medium term	Localised	Likely	Severe	HIGH	- Continue to engage with local communities of Bongweni and eLalini concerning grazing to ensure that there is a clear understanding concerning gthr future limitations on access to grazing in future.	MODERATE

DESIGN AND PLANNING PHASE								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Surface water run-off <u>Storm water management</u> - Inappropriate planning for storm water management could result in erosion and pollution of the natural drainage line that lies adjacent the northern boundary of the proposed site.	Direct/Indirect	Long term	Localised/Nearby river and water systems	Possible	Slight severe	MODERATE	- The PV facility should be located at least 32m away from the identified drainage line. - A Storm Water Management Plan should be designed and implemented to ensure maximum water seepage at the source of water flow. The plan should also include management mitigation measures for water pollution, waste water management and the management of surface erosion e.g. by considering the applicability of contouring, etc.	LOW
<u>Storage of Hazardous substances</u> - Inappropriate planning for the storage of hazardous substances such as diesel, paint, pesticides etc, tools and equipment used on site could lead to surface and ground water pollution e.g. due to oil leaks, spillage of diesel etc. In addition, these hazardous substances could be washed off into the nearby drainage line.	Direct/Indirect	Short term	Localised/Nearby river and water systems	Possible	Slight	LOW	- All hazardous substances such as paints, diesel and cement <u>must</u> be stored in a bunded area with an impermeable surface beneath them. - The developer <u>must</u> designate appropriate areas for the storage of hazardous substances.	LOW
<u>Management of general waste</u> - Inappropriate planning for management and disposal of waste e.g. storage disposal could result in surface and ground water contamination.	Direct/Indirect	Short term	Localised	Possible	Slight	LOW	- Develop and implement a waste management plan for handling on site waste. - Designate an appropriate area where waste can be stored before disposal.	LOW
Avifauna - Overhead transmission lines can negatively affect birds in the area and also affect bird migration patterns e.g. due to electrocutions, bird collisions etc.	Direct/Indirect/Cumulative	Long term	Localised	Possible	Slight	LOW	- If feasible, consider installing underground cables to link the PV facility to the Ngqushwa substation.	LOW
Noise - Inadequate planning for noise impacts from construction and operation of the PV facility could result in noise in the area. Depending on the technology selected, noise effects may result from transformers, inverters, etc.. associated with the PV arrays.	Direct/Indirect/Cumulative	Short term/Long term	Localised	Probable	Moderately severe	MODERATE	- Measures should be put in place to mitigate the impacts of noise during the operational phase of the project, e.g. Consider housing the equipment in enclosed structures.	LOW
Agriculture - Likelihood of other projects (renewable energy or other) in the area that will also lead to loss of agricultural land Refer to specialist agricultural impact assessment at Appendix D-3	Cumulative	Municipal	Long-term	Definite	Slight	LOW	- Land is not a limited resource in the area, and therefore tends not to be intensively used. Land use is largely limited by available water rather than by land itself, and some loss of relatively small parcels of land to agricultural will have very little impact on the total agriculture of the area.	LOW

CONSTRUCTION PHASE								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Dust generation - Dust is likely to be a potential nuisance due to the construction activities.	Direct/Indirect	Short Term	Localised	Possible	Slight	LOW	- Reduce fugitive/nuisance dust by implementing the following: o Damping down of un-surfaced and un-vegetated areas; o Retention of vegetation where possible;	LOW
Loss of biodiversity <u>Construction camp</u> - Unnecessary disturbance of vegetation due to sprawl of campsite can cause loss of biodiversity.	Direct	Short term	Localised	Possible	Moderately severe	MODERATE	- ECO to assist in sighting of structures and supervise any vegetation clearing (although this is not anticipated) for the construction camp. - Construction camp should be fenced to avoid sprawl.	LOW
<u>Vegetation clearing</u> - Unnecessary disturbance of vegetation from construction of ancillary structures i.e. control building, toilet facilities etc. can cause loss of biodiversity.	Direct	Short term	Localised	Possible	Moderately severe	MODERATE	- Vegetation clearing must be restricted to the identified sites for the construction camp, cement mixing circle, ancillary infrastructure lay down areas, underground power cable route, control cabin and other activities on site that have been identified as necessary for development of the project. There must be no unnecessary disturbance of natural vegetation - Where unavoidable, such disturbed areas must be rehabilitated. - Implement a worker environmental education program and implement best management practices.	LOW
<u>Access roads</u> - Unnecessary disturbance of habitats during road construction could cause loss of biodiversity.	Direct	Short term	Localised	Possible	Moderately severe	MODERATE	- Construction vehicles and machinery should only access the site using the existing R345 to the south of PV2 and PV4 to minimise disturbance on the receiving environment.	LOW
<u>Alien and invasive species</u> - Unnecessary disturbance of the areas within the site could increase the risk of spreading noxious weeds, invasive and alien plants.	Direct/Indirect	Short term	Localised	Possible	Moderately severe	MODERATE	- Alien plants should be removed from the site through appropriate methods e.g. hand pulling, chemical, cutting etc. Under supervision from the ECO. - Disturbed areas should be rehabilitated.	LOW
Loss of vegetation during construction Unnecessary damage and disturbance to natural vegetation (Great Fish Thicket) due to uncontrolled construction activities beyond the required footprint of solar panels and associated access infrastructure Refer specialist ecological assessment at Appendix D-2	Direct	Short term	Localised	Probable	Moderately severe	MODERATE	- Construction activities must be limited to the designated development footprint. i.e. construction materials, vehicular storage, construction camps etc, should occur in a footprint which will ultimately be developed as part of the facility. - Actual installation should be undertaken with minimal disturbance to areas in the immediate vicinity as successful vegetation recovery will depend on the remaining vegetation. - Ensure that roads on slopes incorporate storm water diversion. - Where vegetation has been cleared, site rehabilitation in terms of soil stabilisation and re-vegetation must be undertaken - Utilise existing power line servitudes, especially through the Nyana River catchment	LOW
Inadvertent or excessive damage and loss of vegetation beyond the development footprint Refer specialist ecological assessment at Appendix D-2	Indirect	Short term	Study area	Possible	Severe	MODERATE	- Construction activities must be demarcated and vegetation clearing and top soil removal (if required) limited to these areas.	LOW
Loss of plant species of special concern Refer specialist ecological assessment at Appendix D-2	Direct	Permanent	Localised	Possible	Severe	HIGH	- The development area must be surveyed prior to topsoil removal (if required) during construction in order to locate protected geophytic plant species and transplant them into the neighbouring undeveloped environment.	LOW
<u>Fire hazard</u> - Risk that runaway fires from cooking on the construction camp might lead to the burning of surrounding vegetation.	Direct/Indirect	Short term	Localised	Possible	Severe	HIGH	- There should be no burning of construction waste or debris onsite.	MODERATE
Cultural heritage & archaeology - The construction of the development could have a direct physical impact on any undiscovered archaeological remains or other features of cultural heritage on the site.	Direct	Medium term	Localised	Possible	Moderately severe	MODERATE	- Should substantial archaeological and paleontological remains be exposed during construction, the ECO <u>must</u> alert SAHRA so that appropriate action (e.g. recording, sampling or collection) can be taken by a professional archaeologist and/or palaeontologist. - See Heritage Assessment at Appendix D-1	LOW
Noise - Adverse noise effects will occur during the construction of the development, e.g. from the movement of heavy goods vehicles and the use of heavy duty construction equipment for excavation of foundations, vegetation stripping, etc.	Direct	Short Term	Localised	Probable	Moderately severe	MODERATE	- Machinery that causes noise <u>must</u> only be operated at appropriate times (during the day and at normal working hours).	LOW

CONSTRUCTION PHASE								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Socio-economic - It is expected that 50 jobs will be created during the construction phase of the proposed development, in addition to use of other local services, suppliers and sub-contractors.	Direct/Indirect	Short term	Localised	Probable	Very beneficial	HIGH POSITIVE	NO MITIGATION REQUIRED	HIGH POSITIVE
Surface and Ground water contamination <u>Management of construction waste</u> - Waste from construction activities e.g. excess concrete and cement mixture, empty paint containers, oil containers etc., could cause pollution of ground and surface water when they come into contact with run-off water.	Direct/Indirect	Long term	River system	Possible	Moderately severe	MODERATE	- An EMPr incorporating waste management issues during the construction phase of the project must be developed and implemented. - Ensure that all excess waste is disposed of at an appropriately licensed landfill site.	LOW
<u>Hazardous substances</u> - On-site maintenance of construction vehicles/machinery and equipment could result in oil, diesel and other hazardous chemicals contaminating surface and ground water. - Surface and ground water pollution could arise from the spillage or leaking of diesel, lubricants and cement during construction activities.	Direct/Indirect	Long term	River system	Possible	Moderately severe	MODERATE	- All construction materials to be stored in a central and secure location with controlled access with an appropriate impermeable surface. - Ensure that the recommendations of the Storm Water Management Plan are implemented to mitigate the impacts of run-off water on pollution.	LOW
<u>Management of general waste</u> - Littering by construction workers could cause surface and ground water pollution.	Direct/Indirect	Long term	River system	Possible	Moderately severe	MODERATE	- Littering must be avoided and litter bins should be made available at various strategic points on site. - Refuse from the construction site should be collected on a regular basis and deposited at an appropriate landfill.	LOW
Erosion due to degradation of drainage lines - Unplanned construction activities or earthworks that occur close to the drainage line that lies outside the northern boundary of the site could cause adverse impacts such as soil erosion and siltation of drainage lines close to PV2 and PV4.	Direct/Indirect	Short term	Drainage line	Possible	Moderately severe	MODERATE	- No earthworks are to occur within 32 m of the drainage line so as to reduce the risk of erosion.	LOW
<u>Storm water management</u> - Sediment is likely to be created during construction. This could be washed off into the nearby drainage line e.g. during the excavation of PV foundations, the laying of access roads within the site, digging of cable runs and soil stripping and stockpiling to create foundations and temporary areas of hard-standing, such as the construction camp.	Direct/Indirect	Short term	Drainage line	Possible	Moderately severe	MODERATE	- Ensure that the recommendations of the storm water management plan are implemented to avoid soil erosion and siltation of drainage line.	LOW
<u>Soil profile disturbance</u> - Levelling of the site and excavations for the construction of the photovoltaic project will disturb the soil profile. If topsoil becomes buried, or subsoil clay, that is less suitable for root growth, remains at the surface, the agricultural suitability of the soil, that will become available for agriculture again after decommissioning of the photovoltaic project, will be reduced.	Direct/Indirect	Localised	Short-term	Possible	Slight	LOW	- The upper 15cm of top soil must be stripped and stockpiled. It should be retained for re-spreading over disturbed surfaces during rehabilitation - An ECO should monitor all excavations to ensure backfilling with subsoil first and then topsoil afterwards takes place - An ECO should monitor depth and cover of topsoil spreading during rehabilitation to ensure a 15cm depth.	LOW
<u>Replacement of spoil material</u> - The excavation of panel foundations will generate spoil material whose storage can impact on agricultural land.	Direct	Localised	Short-term	Possible	Slight	LOW	- Excavated spoil material should be backfilled wherever possible, or utilised elsewhere, and not spread on agricultural land. - All excavation locations, volumes of spoil and locations of its use must be recorded.	LOW

OPERATIONAL PHASE								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Landscape & visual <u>Lighting</u> - The PV facility may be lit at night during operation which could have adverse impacts on the landscape character and sense of place due to long-term visibility of land by communities of Bongweni and eLalini.	Direct and indirect	Long Term	Localised	Probable	Severe	HIGH	- Reduce night lighting impacts by using shaded lighting and using lights at low levels.	MODERATE
Disturbance to biodiversity <u>Maintenance and cleaning activities</u> - Activities for cleaning and maintenance of the PV e.g. washing of the panels using pressurised water from tankers, mowing or cutting grass under and around the PV panels could cause disturbance to local wildlife due to trampling and crushing of native flora and fauna. Risk of negative impacts could also be increased by increased vehicular and pedestrian traffic within the site.	Direct/Indirect	Long Term	Localised	Possible	Slight	LOW	- Access to the site should be limited to the existing R3345 that runs past the southern boundaries of the PV2 and PV4 sites. - Access within the site should be restricted to the tracks established during the construction phase. - Implement a worker environmental education program.	LOW
Soil erosion and sedimentation Consistent high energy impact from rainfall runoff from the PV panels will result in localised erosion, which may result in larger soil erosion events across the study area, eventually culminating in large scale sedimentation of receiving water bodies. Refer specialist ecological assessment at Appendix D-2	Direct and indirect	Long term	Localised, study area and downstream	Probable	Severe	HIGH	- Rainwater run-off must be captured and released through lower energy mechanisms. - Rainwater harvesting could be considered. - Guttering and localise energy dissipation mechanisms could be implemented - Develop and implement an Erosion Action Programme.	MODERATE
Storage of chemicals, herbicides etc. - Inappropriate storage of chemical, herbicides, diesel and other hazardous substances on site could result in soil and water contamination and also pose a high accident danger risk.	Direct/Indirect	Long term	Localised	Possible	Moderately severe	MODERATE	- Ensure that all hazardous substances are stored in appropriately bunded locations.	LOW
Noise <u>Maintenance and cleaning</u> - Maintenance activities e.g. replacement of PV panels and arrays, mowing grass and cleaning of the PV panels could create adverse noise impacts.	Direct	Long term	Localised	Possible	Slight	LOW	- Limit the washing activities to daytime and within normal working hours.	LOW
<u>Operating equipment</u> - Noise could be generated by electrical equipment such as transformers and inverters, etc.	Direct	Long term	Localised	Possible	Slight	LOW	- Lower noise emission levels from inverters and transformers can be achieved by housing them in enclosed structures.	LOW
Socio-economic - It is expected that an estimated 20 direct permanent jobs will be generated for operating and maintaining the proposed PV facility.	Direct/Indirect	Long Term	Localised	Probable	Highly beneficial	HIGH POSITIVE	- No mitigation required	HIGH POSITIVE
Air quality & climate change - The electricity generated by the development will displace some of that produced by fossil fuel based forms of electricity generation. The scheme, over its lifetime, will therefore avoid the production of a significant amount of CO ₂ , SO ₂ and NO ₂ that would otherwise be emitted to the atmosphere.	Direct/Indirect/ Cumulative	Long term	International	Probable	Highly beneficial	HIGH POSITIVE	- No mitigation is required. - Enhance this impact by promoting the use of renewable energy locally.	HIGH POSITIVE
Increased storm water run off <u>Storm water management</u> - Failure to maintain the storm water system could increase the risk of surface water damage to the landscape and vegetation from increased rates of run-off and therefore the risk of localized flooding and increased erosion downstream due to the presence of roads and impermeable areas of hard standing e.g. the artificial large impermeable surface area created as a result of the PV arrays.	Direct/Indirect	Long Term	River System	Possible	Moderately severe	MODERATE	- Implement recommendations of the Storm Water Management Plan. - Vegetation should be retained where possible to avoid soil erosion. - Re-vegetation of disturbed surfaces should occur immediately after the construction activities are completed to encourage water seepage.	LOW
General pollution <u>Hazardous waste disposal</u> - Damaged and used PV panels could be hazardous if	Direct/Indirect	Medium term	Localised	Possible	Moderately Severe	MODERATE	- Damaged and used PV cells should be characterised and disposed of at hazardous waste site as necessary.	LOW

OPERATIONAL PHASE								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
inappropriately disposed as they may contain small amounts of toxic elements such as cadmium, selenium and arsenic.								
Waste management - There could be littering by maintenance workers and security personnel on site.	Direct/Indirect	Medium – Long term	Localised	Possible	Slight	LOW	- Develop and implement a waste management plan incorporating recycling and waste minimization. - Develop and implement a worker education plan for waste management in the work environment.	LOW
Loss of agricultural land - The occupation of the land by the solar facility will exclude agricultural use of that land for the duration of the project. This will affect an area of approximately 19 hectares.	Direct	Localised	Long-term	Definite	Slight	LOW	- None	LOW
Surface water runoff and erosion - The existence of hard surfaces (panels and roads) will increase run-off and potentially lead to erosion.	Direct/Indirect	Project level	Long-term	Possible	Slight	LOW	- All run-off water must be collected, channelled and disposed of. - The site must be visually monitored as part of the EMPr for occurrences of erosion, which must be recorded. If erosion occurs the necessary changes to the surface drainage system must be implemented.	LOW

DECOMMISSIONING PHASE								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Loss of biodiversity Vegetation clearing - Unnecessary disturbance of vegetation from the decommissioning of ancillary structures i.e. control building, toilet facilities etc.	Direct/Indirect	Short Term	Localised	Possible	Slight	LOW	- Deconstruction vehicles and machinery should make use of existing infrastructure such as roads as far as possible to minimise disturbance on the receiving environment.	LOW
Loss of vegetation during decommissioning of the PV site Unnecessary damage and disturbance to natural vegetation (Great Fish Thicket) due to uncontrolled activities outside of the development footprint. Refer specialist ecological assessment at Appendix D-2	Direct	Short Term	Localised	Probable	Moderately severe	MODERATE	- Decommission activities must be limited to the designated development footprint. - Actual removal of the panels should be undertaken with minimal disturbance to areas in the immediate vicinity as successful vegetation recovery will depend on the remaining vegetation. - Re-vegetation of exposed soil must be undertaken.	LOW
Poor rehabilitation may result in limited re-vegetation and long-term ecological damage. Refer specialist ecological assessment at Appendix D-2	Direct	Long term	Study area	Possible	Severe	HIGH	- Rehabilitation must be undertaken in the following phases: - Applying topsoil and re-landscaping the area to its original condition if modified - Stabilising the soil with synthetic materials or a fast growing plant species - Re-vegetate with plants grown from seed or cuttings from the surrounding vegetation.	LOW
Alien and invasive species - Risk of spreading noxious weeds, invasive and alien plants due to the increased movement of human traffic and machinery during decommissioning.	Direct/Indirect	Short Term	Localised	Probable	Moderately severe	MODERATE	- Ensure that all bare land is rehabilitated after decommissioning. - Develop an alien management plan for the decommissioned site.	LOW
Noise - Adverse noise effects will occur during decommissioning of the site, e.g. from the movement of heavy goods vehicles and the use of heavy duty equipment.	Direct	Short Term	Localised	Probable	Slight	LOW	- Machinery that causes noise only to be operated at appropriate times (during the day and at normal working hours)	LOW
Socio-economic - During decommissioning, the development could provide temporary job opportunities for local communities.	Direct/Indirect	Short Term	Localised	Probable	Beneficial	MODERATE POSITIVE	- No mitigation required	MODERATE POSITIVE
Ground cover Soil erosion - After the removal of all PV-related structures, the disturbed soils could become exposed, unstable and prone to erosion.	Direct/Indirect	Short Term	Localised	Possible	Severe	HIGH	- After the removal of all PV-related structures, the disturbed soils should be re-vegetated to avoid unnecessary soil erosion. - Continue to monitor rehabilitation after site decommissioning	MODERATE
Land Use - Land previously unavailable for certain types of land use will now	Direct/Indirect	Long Term	Localised	Possible	Moderately beneficial	SOME BENEFITS	- NA	SOME BENEFITS

be available for those uses, e.g. industrial, commercial or agricultural.								
General pollution <u>General Waste management</u> - Pollution potential if deconstruction waste is not adequately disposed of (i.e. left on vacant site). - Pollution of the remainder of the site due to poor waste disposal.	Direct	Medium Term	localised	Possible	Moderately severe	MODERATE	- Ensure that all excess waste is disposed of in the licensed landfill site. - There should be no burying or burning of construction waste or debris onsite	LOW
<u>Hazardous Waste management</u> - Old and used PV panels could potentially cause soil and water contamination (ground and surface water) if they are not correctly disposed of after decommissioning.	Direct	Medium Term	localised	Possible	Moderately severe	MODERATE	- All hazardous waste should be classified and disposed of at an appropriate landfill.	LOW

Alternative 2: Alternative – PV2 (straddling drainage line)

DESIGN AND PLANNING PHASE, CONSTRUCTION, OPERATION AND DECOMMISSIONING PHASES								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Location of PV facility relative to the local drainage line The drainage line intersecting PV2 could be very vulnerable to erosion due to onsite activities associated with PV2	Direct	Long term	Local	Possible	Severe	HIGH	- Ensure that any development of PV arrays or other infrastructure is located well away from the drainage line (at least 50 -100 metres)	MODERATE
The remaining impacts are the same as for PV4								

Alternative 1: Alternative – PV1 (proximity to village of KwaCrossman)

DESIGN AND PLANNING PHASE, CONSTRUCTION, OPERATION AND DECOMMISSIONING PHASES								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
Location of PV facility relative to the village of KwaCrossman The close proximity of the PV facility to the village may represent a security risk in terms of panel theft or breakage.	Direct	Short term	Local	Possible	Slight	LOW	- Ensure that any development of PV arrays or other infrastructure is adequately fenced and secured against intentional and unintentional entry by unauthorised persons.	LOW
The remaining impacts are the same as for PV4								

Alternative 4: NO-GO alternative

DESIGN AND PLANNING PHASE, CONSTRUCTION, OPERATION AND DECOMMISSIONING PHASES								
Impacts	Nature of Impact	Duration	Spatial Extent	Probability of Occurrence	Severity / Beneficial Scale	Significance pre-mitigation	Mitigation Measure	Significance post-mitigation
There would be no risk of the negative impacts associated with PV1, PV2 and PV4 being incurred.								
Loss of beneficial opportunities: - The opportunity for job creation during the construction and operational phases of the project would be lost. - The opportunity for the LM to mitigate against fossil fuel combustion and climate change would not be possible - The opportunity to attract renewable energy investment to the area will be lost								