

**ENVIRONMENTAL IMPACT ASSESSMENT
PROCESS
DRAFT BASIC ASSESSMENT REPORT**

**PROPOSED TUTWA SOLAR ENERGY
FACILITY, NORTHERN CAPE**

**DRAFT FOR PUBLIC REVIEW
18 May 2012 - 18 June 2012**

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environmental affairs

Department:
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REPUBLIC OF SOUTH AFRICA

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

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 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.

PROJECT DETAILS

- Title** : Environmental Basic Assessment Process
Draft Basic Assessment Report: Proposed establishment of the Tutwa Solar Energy Facility west of Augrabies, Northern Cape
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- Client** : Flint Ridge Trading (Pty) Ltd
- Report Status** : Draft Basic Assessment Report for public review
- Review Period** : May 2012 - June 2012

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SUMMARY AND OVERVIEW OF THE PROPOSED PROJECT CHAPTER 1

Flint Ridge Trading (Pty) Ltd is proposing the establishment of a Photovoltaic (PV) solar energy facility for the purpose of electricity generation. The project is referred to as the **Tutwa Solar Energy Facility**. The facility will be established over an area of <20 ha on a site ~ 85 km north-west of Kakamas, and ~ 43 km west of Aurgabies Northern Cape. The Tutwa Solar Energy Facility is proposed on Portion 4 of Farm Narries 7. A locality map showing the extent of the site is illustrated in **Figure 1**.

The purpose of the proposed facility is to sell the electricity to Eskom as part of the Renewable Energy Independent Power Producers (IPP) Procurement Programme. The IPP Procurement Programme has been introduced by the Department of Energy (DoE) to promote the development of renewable power generation facilities by IPPs. Selling of electricity according to the IPP Procurement Programme has the advantage of giving developers long-term stability and predictability.

The proposed facility would have a generating capacity of up to 20MW and would comprise:

- » Arrays of photovoltaic panels with a generation capacity of up to 20 MW.
- » Cabling between the project components, to be lain underground where practical;
- » An overhead power line feeding into the Eskom electricity network at Schuitdrift Substation 8 km west of the site;
- » Inverters and transformers(which make up the substation); and
- » Internal access roads; and
- » Workshop area for maintenance and storage.

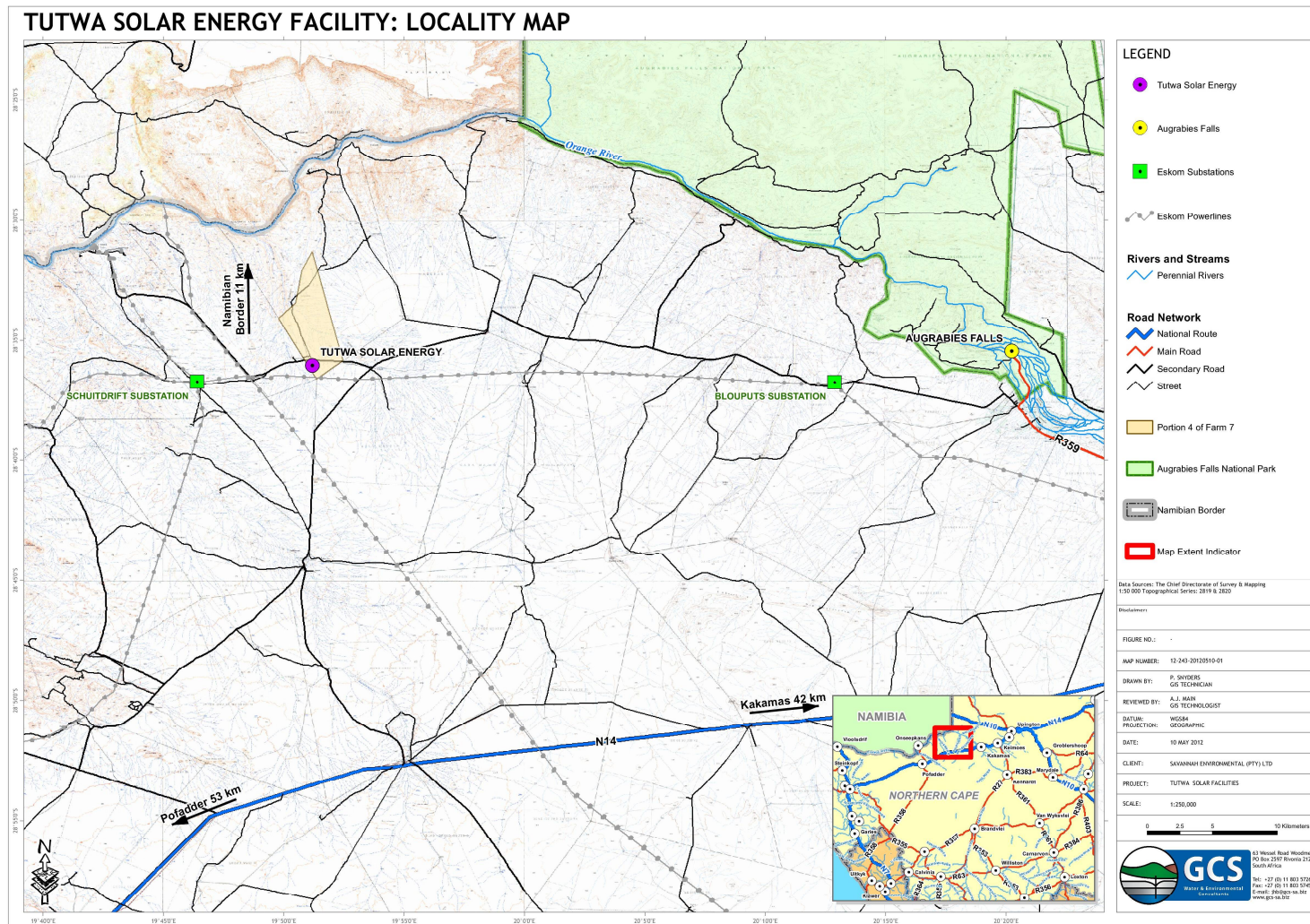


Figure 1: Locality map showing the proposed project development area

1.1. Rationale for the Development of the Proposed Facility

There is increasing pressure globally to increase the share of renewable energy generation due to the exploitation of and large scale reliance on non-renewable resources, and the potential subsequent impacts on climate. South Africa currently depends on fossil fuels for the supply of approximately 90% of its primary energy needs. With economic development over the next several decades resulting in an ever increasing demand for energy, there is some uncertainty as to the availability of economically extractable coal reserves for future use. Furthermore, several of South Africa's power stations are nearing the end of their economic life which is coupled with the expense of the recommissioning of older power stations (i.e. Camden, Komati, and Grootvlei which is expected to cost in the region of R20 billion to return on line).

The current electricity imbalances in South Africa highlight the significant role that renewable energy can play in terms of power supplementation. Given that renewables can generally be deployed in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality, while reducing expensive transmission and distribution losses. At present, South Africa is some way off from exploiting the diverse gains from renewable energy and from achieving a considerable market share in the industry. In order to meet the long-term goal of a sustainable renewable energy industry, a target of 17.8 GW of renewables by 2030 has been set by the Department of Energy (DoE) within the Integrated Resource Plan (IRP) 2010 and incorporated in the IPP Procurement Programme. This energy will be produced from various renewable energy technologies including solar energy facilities (i.e. such as PV technology).

1.2. Requirement for an Environmental Impact Assessment Process

In terms of the EIA Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA, Act No. 107 of 1998), authorisation is required from the National Department of Environmental Affairs (DEA) as the competent authority, in consultation with the Northern Cape Department of Environment and Nature Conservation (DENC), for the establishment of the proposed solar energy facility. In terms of sections 24 and 24D of NEMA, as read with the EIA Regulations of GN R543 – R546, a Basic Assessment process is required to be undertaken for the proposed project.

The following listed activities are applicable:

Relevant Notice	Activity Number	Description of the Listed Activity	Relevance
GN 544, 18 June 2010	1	The construction of facilities or infrastructure for the generation of electricity where: <ol style="list-style-type: none"> i. The electricity output is more than 10 MW but less than 20 MW; or ii. The output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 ha. 	The proposed facility will have a generation capacity of up to 20 MW and will be constructed over an area larger than 1 ha.
GN 544, 18 June 2010	10	The construction of facilities or infrastructure for the transmission and distribution of electricity: <ol style="list-style-type: none"> i. Outside urban areas or industrial complexes with a capacity of more than 33 kV but less than 275 kV; or ii. Inside urban areas or industrial complexes with a capacity of 275 kV or more. 	The facility will require the construction of overhead power line, connecting to the Schuitdrift Substation.
GN 544, 18 June 2010	11	The construction of: <ol style="list-style-type: none"> i. Canals; ii. Channels; iii. Bridges; iv. Dams; v. Weirs; vi. Bulk stormwater outlet structures; vii. Marinas; iii. Jetties exceeding 50 square metres in size ix. Slipways exceeding 50 square metres in size x. Buildings exceeding 50 square metres in size; or xi. Infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measures from the edge of a watercourse , excluding 	Canals, channels, or buildings exceeding 50 m2 may be required to be built with 32 m of a watercourse.

		where such construction will occur behind the development setback line.	
GN 544, 18 June 2010	18	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from:</p> <ul style="list-style-type: none"> i. A watercourse; ii. The sea; iii. The seashore; iv. The littoral active zone, an estuary or a distance of 100 metres inland of the highwater mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing, dredging, excavation, removal or moving; <ul style="list-style-type: none"> a. Is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or b. Occurs behind the development setback line. 	The development of the facility may require the excavation, removal or moving of soil from a watercourse.
GN 544, 18 June 2010	23	<p>The transformation of undeveloped, vacant or derelict land to:</p> <ul style="list-style-type: none"> i. Residential, retails, commercial, recreational, industrial, or institutional use, inside an urban area, and where the total area to be transformed is 5 ha or more but less than 20 ha, or; ii. Residential, retails, commercial, recreational, industrial, or institutional use, outside an urban area, and where the total area to be transformed is bigger than 1 ha but less than 20 ha. 	<p>The proposed project development site is outside an urban area and is currently undeveloped. The land will be transformed to industrial use over an area of less than 20 ha.</p> <p>The developer proposes to use the special rezoning applicable to renewable energy facilities as proposed by government.</p>

GN 546, 18 June 2010	13(c)ii	The clearance of an area of 1 ha or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.	An area of 1 ha or more of indigenous vegetation cover may need to be cleared.
GN 546, 18 June 2010	16(iii)& (iv)	The construction of: i. Buildings with a footprint exceeding 10 square metres in size or ii. Infrastructure covering 10 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	Buildings larger than 10 m ² or 10 m ² within 32 m of a watercourse may be required to be built.

1.3. Details of the Environmental Assessment Practitioner

Savannah Environmental was contracted by Flint Ridge Trading as the independent environmental assessment practitioners (EAP) to undertake the Basic Assessment process for the proposed solar energy facility. Neither Savannah Environmental, nor any of its specialist sub-consultants on this project are subsidiaries of, or are affiliated to Flint Ridge Trading. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

Savannah Environmental is a specialist environmental consultancy which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

The proposed project team members from Savannah Environmental include:

- » *Karen Jodas* who has 15 years of experience in conducting EIAs and in EIA project management.
- » *Marinus Boon* is the principle author of the report. Marinus has an Honours Bachelor of Science degree in Environmental Management and has 4 years of experience in the environmental field and the impacts of construction on the environment.
- » *Gabriele Wood* is the Public Participation and Social Consultant responsible for managing the public participation processes for environmental impact assessment process. Gabriele has an Honours Bachelor Degree in Anthropology and has had 5 years of experience in the public participation and social consulting sector.

Savannah Environmental has gained extensive knowledge and experience on potential environmental impacts associated with electricity generation projects through their involvement in related EIA processes. Savannah Environmental has completed the EIA process and received environmental authorisations for the numerous solar energy facilities.

In order to adequately identify and assess potential environmental impacts, several specialist sub consultants have been appointed to conduct specialist studies, as required.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? **NO** ✓

If YES, please complete the form entitled "Details of specialist and declaration of interest for appointment of a specialist for each specialist thus appointed:
Any specialist reports must be contained in Appendix D.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail¹:

Flint Ridge Trading (Pty) Ltd is proposing the development of the Tutwa Solar Energy Facility, on a site located approximately 85 km north-west of Kakamas (Northern Cape Province) and 43 km west of Augrabies. The project is proposed on the Portion 4 of Farm Narries 7. The electricity generation capacity of the facility will be up to 20 MW.

Infrastructure associated with the proposed PV facility will include:

- » Arrays of photovoltaic panels for up to 20 MW;
- » Mounting structures to support the PV panels;
- » Cabling between the project components, to be lain underground where practical;
- » Invertors;
- » Building a overhead power line to connect into the existing Schuitdrift Substation 8 km west of the proposed facility;
- » Internal access roads; and
- » Office building / workshop.

These components of the PV Facility is discussed in more detail below:

- » **Photovoltaic panels:** A photovoltaic (PV) cell is made of silicone which acts as a semiconductor used to produce the photovoltaic effect. Individual PV cells are linked and placed behind a protective glass sheet to form a photovoltaic panel.
- » **The Support Structure:** The PV panels will be fixed to a support structure set at an angle so to receive the maximum amount of solar radiation. The angle of the panel is dependent on the latitude of the proposed facility and the angles may be adjusted to optimise for summer or winter solar radiation characteristics.
- » **Cables** between the PV panels: Underground cables from the arrays of panels will feed into the invertors.
- » **Invertors:** The photovoltaic effect produces electricity in direct current. Therefore an inverter must be used to change it to alternating current.
- » One 8 km **overhead power line** to connect to the Schuitdrift Substation to the west of the facility
- » Existing road on the farm portion will be used and upgraded where necessary (little to no clearing will be required)
- » **Office / Workshop:** The workshop area (~0.1 ha, 13-20m long, 6-12m wide) will be

¹ Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.

used for storage and employees during the operational life of the facility.

A summary of the technical specification of the PV Facility is shown below.

PV Technology	poly-crystalline
Installed capacity	~16 MW
Panel Dimensions	1.64 x 1m (230Wp)
Final Height of installed panels from ground level	3-4 m
Height of inverters	2.5 m
Height of Transformers	2.5 m
Height of Buildings	3 m
Height of Fencing	2 m

The PV panels are designed to operate continuously for more than 20 years, unattended and with low maintenance. An image of a PV facility is shown in **Figure 2**:



Figure 2: Illustration of a photovoltaic solar energy facility

1.2 Construction of a PV Facility:

In order to construct the proposed PV solar energy facility and associated infrastructure, a series of activities will need to be undertaken. The construction process is discussed in more detail below.

a) Conduct Surveys

Prior to initiating construction, a number of surveys will be required including, but not limited to, a geotechnical survey which have been completed, a site survey and, survey of substation site and road servitudes.

b) Establishment of Access Roads to the Site

Access to the site will be directly from the Southern Farm road via existing entrance and gravel farm access road. Exiting road on the farm portion will be used and upgraded where necessary (little to no clearing will be required). Within the site itself, access will be required to the individual facility components for construction purposes (and later limited access for maintenance). Upgrade of access roads within the site will be required and new access roads will be required. Access track construction would normally comprise of compacted rock-fill with a layer of higher quality surfacing stone on top. Depending on the results of these studies, it may be possible, in some areas, to strip off the existing vegetation and ground surface and level the exposed formation to form an access track surface. The final layout of the access roads will be determined following the identification of site related sensitivities.

c) Undertake Site Preparation

Site preparation activities will include clearance of vegetation at the footprint of each support structure, if required. Vegetation will be kept undisturbed as far as possible in and between the support structures. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site.

d) Transport of Components and Equipment to Site

The components and equipment required for the construction of the proposed facility will be brought to site in sections by means of national and provincial roads and then proposed internal access road. Some of the components (i.e. transformer) may be defined as abnormal loads in terms of the Road Traffic Act (Act No. 29 of 1989)² by virtue of the dimensional limitations (i.e. weight).

Typical civil engineering construction equipment will need to be brought to the site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the upgrade of the substation and site preparation.

e) Establishment of Laydown Areas on Site

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

f) Erect PV Cells and Construct Substation & Inverters

The PV cells will be arranged in arrays. The frames will be fixed onto the ground with the use of concrete / rammed into the ground, depending on the soil conditions, depending on the soil conditions at the site. This will make the installation of the plant less invasive for the territory and facilitate the decommissioning at the end of its production cycle. The height of the PV panel structure will be up to 4 m.

Inverters will be installed to facilitate the connection between the solar energy facility and the Eskom electricity grid via the Schuitdrift Substation. The position of the inverters within the footprint of the broader site will be informed by the final positioning of the PV components.

² A permit will be required for the transportation of these abnormal loads on public roads.

g) Establishment of Ancillary Infrastructure (Power line, on site substation and office)

Ancillary infrastructure includes an overhead power line feeding into the Eskom electricity network via the Schuitdrift Substation, workshop, storage areas as well as a temporary contractor's equipment camp.

An overhead power line will be erected to connect the facility to the Schuitdrift Substation which is located west of the facility. The length of the power line will be 8 km. The following route is proposed: from the south-western corner of the facility it will follow a route 8 km west from the facility to connect to the Schuitdrift substation. Note that the final grid connection will ultimately depend on Eskom.

The establishment of the above ancillary infrastructure will require the clearing of vegetation and levelling of the development site and the excavation of foundations prior to construction. A laydown area for building materials and equipment associated with these buildings will also be required.

h) Undertake Site Rehabilitation

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

1.3 Operation Phase

The electricity that is generated from the PV panels will be stepped up through the on-site inverters and feed into the Eskom Schuitdrift Substation which is located on the site, via an overhead power line.

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 activities for the PV plant will include cleaning of the PV Panel's (using water), trimming of vegetation (underneath the panels) and maintenance of the infrastructure. Water will be required for construction and cleaning the PV panels, as and when needed to remove dust that may collect on the panels. Approximately 5205 m³/wash cycle, 1-2 times per annum will be required during operations for cleaning the PV panels. Flint Ridge Trading proposes to use water from the Southern Farm dams to supply water for the cleaning of the panels over the life of the solar park. These dams are used on a daily basis for grape farming. Application will be required to be made to the Department of Water Affairs for the use of the water at the industrial installation.

1.4 Decommissioning Phase

The solar energy facility is expected to have a lifespan of more than 20 years (with maintenance) and the power plant infrastructure would only be decommissioned once it

has reached the end of its economic life. If economically feasible/desirable the decommissioning activities would comprise the disassembly and replacement of the individual components with more appropriate technology/ infrastructure available at that time. However, if not deemed so, then the facility would be completely decommissioned which would include the following decommissioning activities.

a) Site Preparation

Site preparation activities will include confirming the integrity of the access to the site to accommodate the required equipment (e.g. lay down areas) and the mobilisation of decommissioning equipment.

b) Disassemble Components

The components would be disassembled, and reused and recycled (where possible), or disposed of in accordance with regulatory requirements.

c) Rehabilitation

Disturbed area (where infrastructure has been removed) will be rehabilitated, if required, depending on the future eland-use of the facility.

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 are 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.

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

Site Alternative

A site alternative refers to the identification of more than one potential site which may be suitable for the establishment of a proposed facility. However, the nature of the site

required for renewable energy generation projects often means that assessment of site alternatives is not possible. This specific site has been selected based on the following preferences:

- » Site access (i.e. the site is easily accessible from the Southern Farm road from Augrabies, and then via a secondary gravel road);
- » Site slope and topography; (i.e. the site proposed for the placement of the PV panels is flat with no hills/mountains in the immediate vicinity that would cause shading issues or the need for excessive earthworks); and
- » Access to the national electricity grid for power evacuation (i.e. power line will convey the power from the PV units, through the transformers, to the switchgear and directly to the Schuitdrift Substation) across a distance of approximately 8 km.

As such, no site alternatives have been proposed for the establishment of the proposed solar energy facility.

Activity Alternative

Very few technological options exist in as far as PV technologies are concerned; those that are available are usually differentiated by weather and temperature conditions that prevail – so that optimality is obtained by the final choice. The impacts of any of the PV technology choices are the same. Therefore, the choice of technology does not affect the environmental impact of the proposed development. The construction, operation and decommissioning of the facility will also be the same irrespective of the technology chosen. Therefore, no alternatives were assessed in this regard.

Layout Alternatives

The layout has considered environmental sensitivities during the design phase. As such the preliminary layout has avoided these areas as far as possible.

Operating Alternatives

This refers to the manner in which a proposed facility would function. For example, should a wind energy facility prove problematic for avifauna during migrating periods, an operating alternative of switching off certain turbines during those times could be proposed. No operating alternatives would be applicable to the proposed solar energy facility as there are no feasible means of alternative operation for a facility of this nature.

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:

- Alternative S1³
- Alternative S2 (if any)
- Alternative S3 (if any)

Latitude (S): Longitude (E):

28°	36'03.18"	19°	51'10.82"

In the case of linear activities:

The co-ordinates for the power line is provided below:

Tutwa Power line:

Latitude (S): Longitude (E):

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

28°	36'28"	19°	48'46"
28°	36'36"	19°	48'47"
28°	36' 28"	19°	48'46"

Alternative S2 (if any)

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

Alternative S3 (if any)

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

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250m 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:

- Alternative A1⁴
- Alternative A2 (if any)
- Alternative A3 (if any)

Size of the activity:

~199 000 m ²
m ²
m ²

Or, for linear activities:

Alternative:

- Alternative A1
- Alternative A2 (if any)
- Alternative A3 (if any)

m
m
m

³ "Alternative S." refers to site alternatives

⁴ "Alternative A." refers to activity, process, technology or other alternatives.

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

Alternative:	Size of the site/servitude:
Alternative A1	m ²
Alternative A2 (if any)	m ²
Alternative A3 (if any)	m ²

5. SITE ACCESS

Does ready access to the site exist? **YES** ✓
 If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Access to the site directly from the Southern Farm gravel road from Augrabies. Thereafter the existing access roads within the farm portion will be used and upgraded where necessary. .

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 (refer to Appendix C).

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);
- 6.10 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
- 6.11 The positions from where photographs of the site were taken.

A detailed site/route plan has been included in **Appendix A**.

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*.

Colour photographs have been taken from the centre of the proposed site in the eight major compass directions, refer to **Appendix B**.

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.

A facility illustration which represents a realistic image of the planned solar energy facility is attached within **Appendix C**.

9. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R600 million
What is the expected yearly income that will be generated by or as a result of the activity?	Depends on the BID tariff and variables of the DOE
Will the activity contribute to service infrastructure?	YES ✓
Is the activity a public amenity?	NO ✓
How many new employment opportunities will be created in the development phase of the activity?	50
What is the expected value of the employment opportunities during the development phase?	This will become known after an initial total price has been calculated for the project.

What percentage of this will accrue to previously disadvantaged individuals?	The developer will, as far as possible, ensure maximum opportunities are given to the local community to participate in the construction phase
How many permanent new employment opportunities will be created during the operational phase of the activity?	2-20
What is the expected current value of the employment opportunities during the first 10 years?	Not known.
What percentage of this will accrue to previously disadvantaged individuals?	20% to be employed from PDI as a minimum standard as part of the department of energy program.

9(b) Need and desirability of the activity

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

NEED:		
1.	Was the relevant provincial planning department involved in the application?	YES✓
2.	Does the proposed land use fall within the relevant provincial planning framework?	YES✓
3.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:	

DESIRABILITY:		
1.	Does the proposed land use / development fit the surrounding area?	YES✓
2.	Does the proposed land use / development conform to the relevant structure plans, SDF, and planning visions for the area?	YES✓
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES✓
4.	If the answer to any of the questions 1 - 3 was NO, please provide further motivation / explanation:	
5.	Will the proposed land use / development impact on the sense of place?	NO✓
6.	Will the proposed land use / development set a precedent?	NO✓
7.	Will any person's rights be affected by the proposed land use	NO✓

	/ development?		
8.	Will the proposed land use / development compromise the "urban edge"?		NO ✓
9.	If the answer to any of the question 5 - 8 was YES, please provide further motivation / explanation.		

BENEFITS:			
1.	Will the land use / development have any benefits for society in general?	YES ✓	
2.	Explain: The evacuation of additional power into the Eskom grid will serve to increase the country's energy mix and the stability of the grid for the immediate area.		
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES ✓	
4.	Explain: Job opportunities, albeit limited, will be created during the construction (i.e. 50) and operation (i.e. 20) of the proposed facility.		

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 Administering authority:
guideline:**

Date:

National Environmental Management Act (Act No. 107 of 1998)	» National Department of Environmental Affairs » Northern Cape Department of Economic Development, Environment, and Tourism	1998
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	» National Department of Environmental Affairs	2004
National Environmental Management: Waste Act (Act No. 59 of 2008)	» National Department of Water Affairs » Northern Cape Department of Environment and Nature Conservation	2008
National Water Act (Act No. 36 of 1998)	» National Department of Water Affairs » Northern Cape Department of Water Affairs	1998

Environment Conservation Act (Act No. 73 of 1989)	<ul style="list-style-type: none"> » National Department of Environmental Affairs » Northern Cape Department of Environment and Nature Conservation » Local Authority 	1989
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	» Department of Mineral Resources	2002
National Heritage Resources Act (Act No. 25 of 1999)	» South African Heritage Resources Agency	1999
National Forests Act (Act No. 84 of 1998)	» Department of Forestry	1998
National Veld and Forest Fire Act (Act 101 of 1998)	» Department of Forestry	1998
Government Notice No. 1477 of 2009: Draft National List of Threatened Ecosystems	» Provincial Department of Environmental Affairs	2009
Subdivision of Agricultural Land Act (Act No. 70 of 1970)	» Department of Agriculture	1970
Hazardous Substances Act (Act No. 15 of 1973)	» Department of Health	1973
National Road Traffic Act (Act No 93 of 1996)	<ul style="list-style-type: none"> » South African National Roads Agency Limited (national roads) » Provincial Department of Transport 	1996
Development Facilitation Act (Act No 67 of 1995)	» Local and District Municipality	1995
Promotion of Access to Information Act (Act No. 2 of 2000)	» National Department of Environmental Affairs	2000
Promotion of Administrative Justice Act (Act No. 3 of 2000)	» National Department of Environmental Affairs	2000
Guideline Documents		
Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads	» Provincial Department of Transport	
Provincial Planning		
Land Use Planning Ordinance 15 of 1985	» Details land subdivision and rezoning requirements and procedures	1985
Policies and White Papers		
The White Paper on the Energy Policy of the Republic of South Africa (December 1998)	» Department of Energy	1998

The White Paper on Renewable Energy (November 2003)	» Department of Energy	2003
The White Paper on the Energy Policy of the Republic of South Africa (December 1998)	» Department of Energy	1998
Miscellaneous		
Kai ! Garib Municipality	» IDP	2011 - 2012

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

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

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

YES ✓	
Packaging materials for the various components, excess concrete spillage and excess building materials will be produced on site during the construction phase.	

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

Waste bins/skips will be place on site to collect the waste materials and these will be disposed of on a weekly/monthly basis dependent on quantities.

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

Reputable waste disposal companies will be used to dispose of the waste. These companies will be audited to ensure they dispose of waste effectively and legally.

Will the activity produce solid waste during its operational phase?

NO ✓

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

m ³

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

--

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

--

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

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

	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?

	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?

	NO ✓
--	-------------

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

m ³

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

	NO ✓
--	-------------

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

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

	NO ✓
--	-------------

If yes, provide the particulars of the facility:

Facility name:

--

Contact person:

--

Postal address:

--

Postal code:

--

Telephone:

Cell:

E-mail:

Fax:

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

--

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

<input checked="" type="checkbox"/>	NO ✓

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

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

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

Solar energy installations operate by converting solar energy into electricity. This is characterised as a non-consumptive use of a natural resource and consumes no fuel for its continuing operation. Solar power produces an insignificant quantity of greenhouse gases over its lifecycle as compared to conventional coal-fired power stations. The operational phase of a solar facility does not produce carbon dioxide, sulphur dioxide, mercury, particulates, or any other type of air pollution.

11(d) Generation of noise

Will the activity generate noise?

<input checked="" type="checkbox"/>	NO ✓

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

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

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

--

12. WATER USE

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

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

The option for sourcing water for construction and operation include utilising water from farm dams that occur on the site.

Construction phase:

- » Raw water for earthworks: Total of 1,410 m³ per month for a period of 5 months.
- » Raw water for dust suppression: Total of 4,350 m³ for duration of civil works (5 months) based on one 30m³ water cart a day.
- » Potable water for construction: Total of 1,460 m³ for duration of construction (10 months) based on 10 litres per person per day and 400 construction people on site.
- » No allowance for batching plant: Assuming ready mixed concrete will be used.

Generation phase

- » Potable water for offices: Total of 110 m³ per year based on 6 people at 50 litres per person per day.

Panel Cleaning

- » Total of 5,205 m³ per year..

Water will be trucked in (i.e. likely from the Southern Farm dams) and high pressure hoses will be used to clean the panels.

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

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

	YES ✓
--	-----------------

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:

Not applicable.

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

This is not applicable, as the installation itself is a renewable/alternative energy project.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

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

2. Has a specialist been consulted to assist with the completion of this section? **NO** ✓

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed.

All specialist reports must be contained in **Appendix D**.

Property description/physical address:

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

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

Current land-use zoning:

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? **YES** ✓

Must a building plan be submitted to the local authority? **YES** ✓

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).

The locality map has been included and attached as **Appendix A**:

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

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

Alternative S2 (if any):

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

Alternative S3 (if any):

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

2. LOCATION IN LANDSCAPE

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

Alternative S1:

- 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 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep).	NO ✓	YES NO	YES NO
Dolomite, sinkhole, or doline areas.	NO ✓	YES NO	YES NO
Seasonally wet soils (often close to water bodies).	NO ✓	YES NO	YES NO
Unstable rocky slopes or steep slopes with loose soil.	NO ✓	YES NO	YES NO
Dispersive soils (soils that dissolve in water).	NO ✓	YES NO	YES NO
Soils with high clay content (clay fraction more than 40%).	NO ✓	YES NO	YES NO
Any other unstable soil or geological feature.	NO ✓	YES NO	YES NO
An area sensitive to erosion.	YES ✓	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).

Alternative S1:

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.

Simon Todd who is an independent Ecologist undertook an ecological study for the proposed facility, refer to Appendix D1.

5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500 m 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 and 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 ✓ (Grazing)

- 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?

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:

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:

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:

The only sign of sites of heritage potential were the limited scatterings of quartzite, Late Stone Age tools found in one area. These finds in themselves do not constitute a site but do indicate the possible occurrence of such sites.

The area could still contain the remains of nomadic hunter/gatherer camps and some areas with suitable substrates could have been used as quarries for material to produce Stone Age tools. No such sites were however identified. We should however in this case apply the rule of Absence of Evidence is not Evidence of Absence. It is therefore recommended that the finalized power line alignment route be subjected to a walk-down by a qualified archaeologist before construction commences to identify any archaeological or burial sites. The stone artefact occurrences and scatters are considered as having a medium-low cultural significance and the recommendations must be taken into consideration prior to the construction activities.

The stone artefact occurrences and scatters has been allocated a heritage grading of Grade III (NHRA 25 of 1999) being worthy of conservation by local authorities.

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:

In one area scatterings of surface stone tools were noticed, however these were not concentrated enough to be classified as a Stone Age Site. Their presence does indicate that such sites could still be found under the sub-surface. No other archaeological heritage remains, features or sites were observed within the area proposed for development. No permit would be required in terms of the National Heritage Resources Act, 1999 (Act No 25 of 1999).

Will any building or structure older than 60 years be affected in any way?

	NO✓
	NO✓

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

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

» ADVERTISEMENTS AND NOTICES

- » A2 site notices were placed on the boundary fence of the project development site (i.e., at gates along existing access roads).
- » A4 site notices were also placed at the Keimoes and Kakamas municipal offices and also at the Kakamas Library.
- » A stakeholder letter was distributed to the database which included key stakeholders and organs of state relevant to the proposed project. The stakeholder letters served to announce the proposed project, and announce the review period for the draft Basic Assessment Report.
- » An advert was placed in the Volksblad of May 2012 to advertise the Basic Assessment process and the availability of the draft Basic Assessment Report.

Refer to **Appendix E** for proof of placement of the advertisements, site notice, and letters to stakeholders.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

The contents of the notices and adverts were in accordance with the following requirements:

- (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.

The proposed installation is unlikely to result in any direct impacts that extend beyond the municipal area where it is located. Regardless, an advert was placed in the Volksblad to advertise the Basic Assessment process and the availability of the draft Basic Assessment Report.

The advertisement placed detailed the Basic Assessment process, the nature, and location of the proposed project, where further information on the proposed activity could be obtained and the manner in which representations on the application could be made. The advertisement also indicated the availability of the draft Basic Assessment Report for public review.

Copies of the advertisement and proof of placement is included within Appendix E.

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.

The public participation process included the following mechanisms to ensure public involvement, and was considered to be adequate for the involvement of the public in the process:

1. Opening and maintaining a stakeholder/I&AP database
2. Circulation/distribution of a background information document and stakeholder letters for the project to the database
3. Placement of advertisements in the local and regional press
4. Placement of site notices on the property, and in the local town at common places.
5. Holding a meeting with Kai ! Garib Local Municipality.

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.

All issues, comments, and/or concerns raised to date have been captured and recorded within the comments and response report (refer to Appendix E).

6. AUTHORITY PARTICIPATION

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

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.

Authorities were informed of the Basic Assessment process through the submission of a stakeholder letter, these included, but was not limited to:

- » DENC
- » Kia ! Garib Local Municipality
- » Siyanda District Municipality
- » Provincial Department of Agriculture, Forestry and Fisheries
- » National Department of Agriculture, Forestry and Fisheries
- » Provincial Department of Water Affairs
- » South African National Roads Agency Limited
- » Northern Cape Department of Roads and Public Works
- » Northern Cape Department of Economic Development
- » South African Civil Aviation Authority
- » South African Heritage Resources Agency
- » Northern Cape Heritage Authority

Refer to **Appendix E6** for proof of notification of these organs of state.

List of authorities from whom comments have been received:

None to date.

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 sub regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable.

Potentially affected stakeholders have been identified and consulted regarding the proposed project and include inter alia: neighbouring landowners; parastatals; conservation authorities and members of the public.

A stakeholder database of is attached in Appendix E

Has any comment been received from stakeholders?

YES ✓

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

All comments received, as well as responses provided will be captured and recorded within the Comments and Response Report (refer to Appendix E). Refer to Appendix E for the minutes of the meetings.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should consider applicable official guidelines. 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.

The main issues raised during meeting with the local municipality include:

1. The requirement for a community trust.
2. The rezoning for the facilities.

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 as Annexure E):

In summary the responses to points 1-3 above is as follows:

1. Regarding community trust, according to DoE bidding requirements 2% of the profit per annum from the PV facility to go back into the community through a beneficiation scheme.
2. The PV facility will rezoned as a special land-use.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING, 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.

2.1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

Alternative (preferred alternative)

No impacts are anticipated that may result from the planning and design phase of the proposed development.

2.2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

Potential impacts associated with the construction of the proposed project are discussed below. The following methodology was used in assessing impacts related to the proposed development. All impacts are assessed according to the following criteria:

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

- » The degree to which the impact may cause irreplaceable loss of resources.
- » The degree to which the impact can be mitigated.

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

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

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

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

Detailed specialist studies is included within **Appendix D** which details the potential environmental impacts on heritage resources, soil erosion and agricultural potential and ecological impacts on the flora and fauna, and visual impacts.

Impacts on Ecology

According to the national vegetation map the vegetation in the site is Blouputs Karroid Thornveld. Blouputs Karroid Thornveld occurs as a belt of irregular flat areas from the vicinity of Augrabies Falls in the east to Kotie se Laagte and Samoep se Laagte in the west. The vegetation type is listed as Least Threatened and less than 1% has been transformed. It is well conserved (27%) within Augrabies Falls National Park.

The site falls within the distribution range of 46 terrestrial mammals, indicating the mammalian diversity at the site is potentially quite high. The site lies in or near the distribution range of at least 45 reptile species, indicating that the reptile diversity at the site is likely to be quite high. The site lies within the distribution range of six amphibian species. However, given the paucity of surface water at the site, only those species able to persist away from perennial water are likely to occur at the site. According to the SABAP 1 and 2 data sets, 130 bird species are known from the broad area surrounding the site.

Overall, four major risk factors were identified as being associated with the development and were assessed, as follows:

- » Impacts on vegetation and protected plant species
- » Increased erosion risk
- » Increased levels of noise, pollution, disturbance and human presence will be

detrimental to fauna.

- » Direct and indirect impacts of the development on avifauna (risk of electrocution and collisions)

Some loss of vegetation and faunal habitat at the site is an inevitable consequence of the development, and cannot be mitigated, but is not highly significant in the broader context. A number of *Aloe dichotoma* trees, which is a protected species were observed within the site and a permit for their removal would be required obtainable from DENC, while nationally protected species are regulated by DAFF. As a large proportion of the trees were relatively young, it is strongly recommended that they be translocated outside the development footprint before construction.

Erosion risk is identified as a particular concern during the construction and early operational phases of the development as a result of the high levels of disturbance which are likely to accompany the construction of the facility. Specific measures to combat erosion should form part of the design and construction of the facility. The remaining impacts can be effectively mitigated to a low level with standard mitigation measures.

From a general ecological perspective, the site is not viewed as being highly sensitive. No endangered plant species were observed to occur within the proposed development area and there are no listed faunal species with a narrow distribution which occur at the site. Furthermore, outside of the drainage lines, there were no highly sensitive habitats at the site which would warrant specific avoidance or mitigation. Overall, the site is not highly ecologically sensitive and provided that the mitigation measures as described in the report are adequately implemented, then the development would pose little risk of creating long-term ecological degradation of the receiving environment.

The ecological sensitivity map for the site is depicted below (Figure 3). The dominant feature in terms of the sensitivity map are the drainage lines which dissect the site. As the substrate adjacent to the drainage lines is hard, there are no associated plant communities outside of the channel itself and the riparian vegetation is confined to a narrow band within the channel itself. As a result, construction could take place to within a few meters of the channels without impacting their composition or functioning. As a result, the smaller drainage lines at the site have been buffered by five meters, while the larger drainage channels have been buffered by fifteen meters, which is deemed adequate to maintain their ecological functioning.

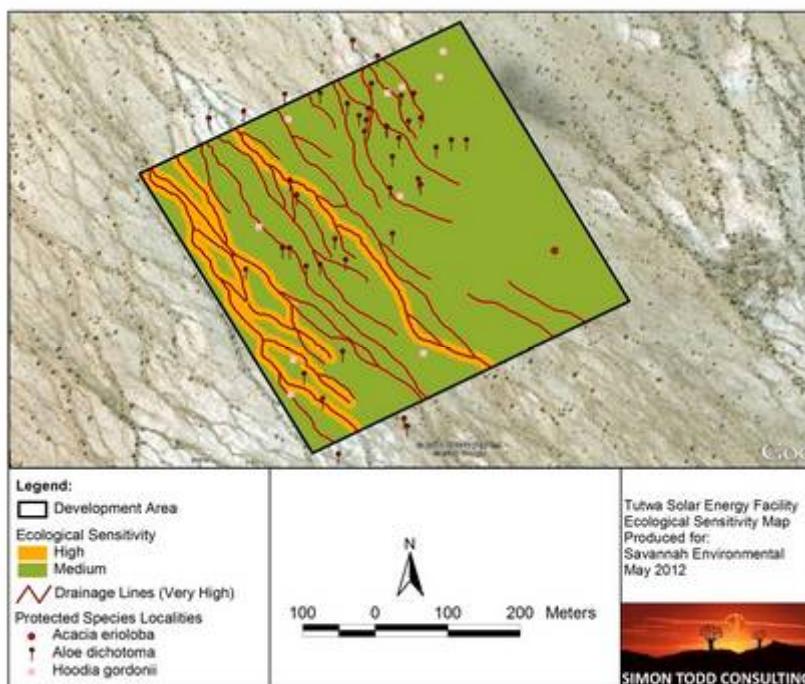


Figure 3. Ecological Sensitivity map of the proposed Tutwa Solar Energy Facility site, including the localities of protected species.

Impact tables summarising impacts on the ecology: proposed development site

<i>Nature : Impacts on vegetation and protected plant species would occur due to the construction of the facility.</i>		
	<i>Without mitigation</i>	<i>With mitigation</i>
<i>Extent</i>	Local (3)	Local (1)
<i>Duration</i>	Medium-term (3)	Short-term (2)
<i>Magnitude</i>	Medium (7)	Low (2)
<i>Probability</i>	Definite (5)	Highly Probable (4)
<i>Significance</i>	High (65)	Low (20)
<i>Status (positive, neutral or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Irreplaceable loss of resources?</i>	Yes	
<i>Can impacts be mitigated?</i>	Low degree	
<i>Mitigation:</i>		
<ul style="list-style-type: none"> » Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared. » Sensitive areas as demarcated on the sensitivity map should be avoided as far as possible, and where these areas must be traversed by roads of infrastructure, specific precautions should be taken to ensure that impacts are minimized. 		

<ul style="list-style-type: none"> » The final development area should be surveyed for species suitable for search and rescue such as <i>Aloe dichotoma</i> and <i>Hoodia gordonii</i>. » Surveys for and clearing of alien plants should take place on at least an annual basis.
<p>Cumulative impacts: There are a number of other solar energy facilities planned for the area, but the current site is small in comparison and the contribution of the current development to cumulative impacts is likely to be low.</p>
<p>Residual impacts: Some loss of vegetation is inevitable and cannot be avoided.</p>

Nature: Increased erosion risk as a result of soil disturbance and loss of vegetation cover.		
	Without mitigation	With mitigation
Extent	Local (2)	Local (1)
Duration)	Long-term (4)	Short-term (2)
Magnitude	Medium (4)	Low (2)
Probability	Highly Probable (4)	Improbable (2)
Significance	Low (40)	Very Low (10)
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	High degree	
<p>Mitigation:</p> <ul style="list-style-type: none"> » Roads should run along the contour wherever possible and roads that do not should have diversion structures in place at regular intervals to ensure that water flow and movement is regulated in a manner which minimizes erosion risk. » Roads which cross drainage lines should be constructed in manner which does not encourage erosion of the downstream channel and does not disrupt the natural flow of water down the channel. » Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance. » All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. 		
<p>Cumulative impacts: Higher sediment loads in rivers and streams will affect in-stream vegetation and biota.</p>		
<p>Residual impacts: If erosion at the site is controlled, then there will be no residual impact..</p>		

Nature: Faunal habitat destruction, alteration and physical disturbance.		
	Without mitigation	With mitigation
Extent	Local (2)	Local (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Medium (4)	Medium-Low (3)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (40)	Low (24)
Status (positive, neutral or negative)	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Low degree	
<p>Mitigation:</p> <ul style="list-style-type: none"> » Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. » The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. » Fires should only be allowed within fire-safe demarcated areas. » No fuelwood collection should be allowed on-site. » No dogs should be allowed on site. » If the site must be lit at night for security purposes, this should be done with low-UV type lights (such as most LEDs), which do not attract insects. » If the site must be fenced, then provision should be made for faunal access at least at strategic sites such as where drainage lines enter or leave the site. » All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. » No unauthorized persons should be allowed onto the site. <p>Staff present during the operational phase should receive environmental education so as to ensure that that no hunting, killing or harvesting of plants and animals occurs.</p>		
<p>Cumulative impacts:</p> <p>The site is adjacent to a fairly busy road and so the additional contribution to faunal impact for larger species at least is not likely to be very large. Although there are a number of other planned facilities in the area, the landscape remains overwhelmingly intact and the potential for the disruption of landscape connectivity through cumulative impact currently remains low.</p>		
<p>Residual impacts:</p> <p>Residual impacts for fauna would be largely restricted to a small amount of habitat loss.</p>		

Nature: Negative impacts on avifauna, including listed species as a result of disturbance, electrocution and collisions.		
	Without mitigation	With mitigation
Extent	Local (2)	Local (1)
Duration	Long-term (5)	Short-term (2)
Magnitude	Medium (3)	Low (2)
Probability	Highly Probable (4)	Probable (3)
Significance	Medium (40)	Very Low (15)
Status (positive, neutral or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	High degree	
Mitigation:		
<ul style="list-style-type: none"> » Any new lines required as part of the development should be aligned with existing lines if possible. » Ensure that all new lines are marked with bird flight diverters along their entire length. » All new power line infrastructure should be bird-friendly in configuration and adequately insulated (Lehman et al. 2007). These activities should be supervised by someone with experience in this field. » Any electrocution and collision events that occur should be recorded, including the species affected and the date. If repeated collisions occur within the same area, then further mitigation and avoidance measures may need to be implemented. 		
Cumulative impacts:		
The development would contribute to cumulative avifaunal impacts in the area resulting from electrocution and collisions. However, these impacts can be avoided to a large extent through mitigation.		
Residual impacts:		
Despite mitigation actions which are not entirely effective, some birds are still likely to be killed on an occasional basis. Furthermore, the facility itself would represent some habitat loss for avifauna.		

- » A permit from NC DENC will be required for the removal of protected plant species from the site.
- » Layout of the facility to avoid drainage lines and associated buffer zones as shown on the ecological sensitivity map.
- » Mitigation measures to protect the vegetation, drainage lines , ground cover and fauna should be implemented via the EMP.

Impacts on soils and agricultural potential

The areas are comprised of shallow to very shallow, red and red-brown sandy or sandy loam topsoils, often calcareous. The presence of rock outcrops along with the very shallow soils in the study areas mean that, even if a source of water for irrigation was available, the potential of these soils for irrigation would be almost non-existent.

The impact on the natural resources of the proposed site would be the loss of potentially arable land due to the construction of the various types of infrastructure. The land-use for the development footprint will change from agriculture to PV facility, however grazing will continue on the rest of the farm. However, due to the dry and hot climate of the region, this impact would in all probability be of limited significance and would be local in extent.

Due mainly to the prevailing unfavourable climatic conditions for arable agriculture, as well as the prevalence of soils with limited depth, it is not envisaged that any more detailed soil investigation will be required.

Nature: Loss of agricultural land at the development footprint of the PV Facility.		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Low (2)
Probability	Highly probable (4)	Probable (4)
Significance	36 (Medium)	28 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: There are no high potential soils occurring on site. The soils have grazing potential at best. Disturbance of the topsoil layer should be kept to a minimum to optimize potential future grazing areas.		
Cumulative Impacts: Little with the necessary mitigation in place		
Residual Impacts: Little with the necessary mitigation in place		

Nature: Soil erosion on the construction site during and after the construction phase due to decreased vegetation cover and increased effect of prevailing wind		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	Medium-term (3)	Short-term (2)

Magnitude	Low (4)	Very low (2)
Probability	Probable (3)	Improbable (2)
Significance	24 (Low)	10 (Very low)
Status (positive or negative)	Negative	Neutral
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation:	Care must be taken with the ground cover during and after construction on the site. If it is not possible to retain a good plant cover during construction, technologies should be employed to keep the soil covered by other means, i.e. straw, mulch, erosion control mats, etc., until a healthy plant cover is again established. (Care should also be taken to control and contain storm water run-off, even though this is likely to be very infrequent)	
Cumulative Impacts:	Little with the necessary mitigation in place	
Residual Impacts:	Little with the necessary mitigation in place	

Implications for project implementation:

- » Erosion control measures (as contained in the EMP) will have to be implemented during the construction of the PV facility and soil erosion to be monitored during the operational life of the facility.
- » Development and implementation of a storm water management plan during all phases of the development is essential to minimise the potential for erosion.

Impacts on Heritage Resources

The only sign of sites of heritage potential were the limited scatterings of quartzite, Late Stone Age tools found in one area. These finds in themselves do not constitute a site but do indicate the possible occurrence of such sites.

The area could still contain the remains of nomadic hunter/gatherer camps and some areas with suitable substrates could have been used as quarries for material to produce Stone Age tools. No such sites were however identified. We should however in this case apply the rule of Absence of Evidence is not Evidence of Absence. It is therefore recommended that the finalized power line alignment route be subjected to a walk-down by a qualified archaeologist before construction commences to identify any archaeological or burial sites. The stone artefact occurrences and scatters are considered as having a medium-low cultural significance and the recommendations must be taken into consideration prior to the construction activities.

The proposed area for development is considered as having a low cultural sensitivity, and the following recommendations must be taken into consideration prior to the construction activities.

<i>Nature: Possible pre-contact Stone Age site could be damaged locally by excavation activities and associated activities</i>		
	<i>Without mitigation</i>	<i>With mitigation</i>
Extent	Local (2)	Local (2)
Duration	Long term (5)	Long term (5)
Magnitude	Medium (3)	Low (1)
Probability	Probable (3)	Improbable (1)
Significance	Medium (30)	Low (8)
Status (positive or negative)	Negative	Positive
Reversibility	Irreversible	Irreversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Local (2)	Local (2)
Mitigation: » Walk-down phase before construction		
Cumulative impacts: » None		
Residual impacts: » Loss of heritage related information.		

<i>Nature: Paleontological sites could be affected if bedrock was to be disturbed during the excavation activities associated with the construction of the pylon foundations.</i>		
	<i>Without mitigation</i>	<i>With mitigation</i>
Extent	Local (2)	Local (2)
Duration	Short term (2)	Long term (5)
Magnitude	Low (2)	Low (1)
Probability	Improbable (2)	Improbable (1)
Significance	Low (12)	Low (8)
Status (positive or negative)	Negative	Positive
Reversibility	Irreversible	Reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	No	Yes
Mitigation: » Walk-down phase before construction		
Cumulative impacts: » None		
Residual impacts: » Loss of heritage related information.		

<i>Nature: Limited impacts on the cultural landscape are anticipated.</i>		
	<i>Without mitigation</i>	<i>With mitigation</i>
Extent	Local (2)	Local (2)
Duration	Short term (2)	Long term (2)
Magnitude	Low (1)	Low (1)
Probability	Improbable (3)	Improbable (3)
Significance	Low (15)	Low (15)
Status (positive or negative)	Positive	Positive
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes
Mitigation: » No further mitigation is recommended		
Cumulative impacts: » None		
Residual impacts: » None		

Implications for project implementation:

- » A walk-down heritage survey of the final alignment of the power line should be done prior construction begins.
- » If archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken.
- » Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

Impacts on the socio-economic environment

<i>Nature: Job creation</i>		
Approximately 50 people are expected to be required during the construction phase (which is expected to take place over a period of 12 months) of which 90% is estimated to be low skilled/semi-skilled positions, and 10% skilled.		
	<i>Without enhancement</i>	<i>With enhancement</i>
Extent	Local (1)	Local (1)
Duration	Very short (2) *	Very short (2) *
Magnitude	Minor (2)	Low (4)
Probability	Probable (3)	Probable (3)

Significance	Low (15)	Low (21)
Status (positive or negative)	Positive	
Reversibility	N/A	
Irreplaceable loss of resources?	N/A	
Can impact be enhanced?	Yes	
Enhancement measures:		
» Maximise the use of local labour for low – semi skilled jobs far as possible.		
Cumulative impact:		
» The development of additional renewable energy facilities in the region may serve to increase the potential for job creation.		
Residual impact:		
» Once the construction phase is complete, locals may not be able to find future employment.		
» Alternatively local employed during the construction phase may learn new skills thereby making them more employable in the future.		

No Go Alternative

The 'Do-Nothing' alternative is the option of not constructing the proposed Tutwa Solar Energy Facility. The land-use of the facility is currently agriculture and would continue to be agricultural land if the facility is not developed. Should this alternative be selected then the socio-economic and environmental benefits of this renewable energy facility will not be realised. These benefits are explored in further detail in the South Africa REFIT Regulatory Guideline published by NERSA (March 2009), and include:

- » **Increased energy security:** The current electricity crisis in South Africa highlights the significant role that renewable energy can play in terms of power supplementation. In addition, given that renewables can often be deployed in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality, while reducing expensive transmission and distribution losses.
- » **Resource saving:** Conventional coal fired plants are major consumers of water during their requisite cooling processes. It is estimated that the achievement of the targets in the Renewable Energy White Paper will result in water savings of approximately 16.5 million kilolitres, when compared with wet cooled conventional power stations; this translates into revenue savings of R26.6 million. As an already water-stressed nation, it is critical that South Africa engages in a variety of water conservation measures, particularly due to the detrimental effects of climate change on water availability.
- » **Exploitation of our significant renewable energy resource:** At present, valuable national resources including biomass by-products, solar radiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio.
- » **Pollution reduction:** The releases of by-products through the burning of fossil fuels for electricity generation have a particularly hazardous impact on human health and

contribute to ecosystem degradation.

- » **Climate friendly development:** The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of greenhouse gas (GHG) emissions. South Africa is estimated to be responsible for ~1 % of global GHG emissions and is currently ranked 9th worldwide in terms of per capita CO₂ emissions.
- » **Support for international agreements:** The effective deployment of renewable energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under the Kyoto Protocol, and for cementing its status as a leading player within the international community.
- » **Employment creation:** The sale, development, installation, maintenance and management of renewable energy facilities have significant potential for job creation in South Africa.
- » **Acceptability to society:** Renewable energy offers a number of tangible benefits to society including reduced pollution concerns, improved human and ecosystem health and climate friendly development.
- » **Protecting the natural foundations of life for future generations:** Actions to reduce our disproportionate carbon footprint can play an important part in ensuring our role in preventing dangerous anthropogenic climate change; thereby securing the natural foundations of life for generations to come.

The No-Go alternative is not preferred as South Africa needs to diversify our electricity sources, which this project will contribute to.

2.3. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

Visual Character of the Site & Surrounds:

The area is used for agricultural use and the most important land use is commercial grape farming. The vegetation is open with scattered scrubs and trees. The site is far from any town and residential areas, Augrabies the closest town is 43 km to the east. There is no major tourist routes passing the area, the area is mostly used and accessed by the local farmers. The proposed site is located in an area which is lower than the surrounding areas. Rocky outcrops are seen in the surrounding areas.

Potential Visual Impacts

The Tutwa PV Facility will consist of PV panels and a distribution power line (~8 km in length) that will be visible on the site and to the surrounds. The visibility of PV panels may be a negative impact, depending on the people who live near the site or travel past the site on a regular basis. What is perceived as a negative impact is subject to individual preferences. Nevertheless, as part of the assessment of potential impacts, visual impacts (which is a social impact) has been explored in this assessment.

The physical dimensions of the proposed solar infrastructure of particular relevance to the assessment of visual impact include:

Final Height of installed panels from ground level	~4 m
Height of inverters	~2.5 m
Height of Transformers	~1.8 m
Height of Buildings	~3 m
Height of Fencing	~ 2 - 3 m
Height of Power line	~8 km in length

Impact tables summarising visual impacts

<i>Nature of Impact: Potential visual impact on sensitive visual receptors on the surrounding farm areas</i>		
	<i>No mitigation</i>	<i>Mitigation considered</i>
<i>Extent</i>	Local (1)	Regional (1)
<i>Duration</i>	Long term (4)	Long term (4)
<i>Magnitude</i>	Moderate (4)	Moderate (4)
<i>Probability</i>	Probable (3)	Improbable (2)
<i>Significance</i>	Medium (27)	Low (18)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Recoverable (3)	Recoverable (3)
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes, but to a limited extent	

Mitigation:

Planning:

- » Retain and maintain natural vegetation in all areas outside of the development footprint.
- » Plan internal roads and ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. Consolidate infrastructure as much as possible.

Construction:

- » Rehabilitation of all construction areas.
- » Ensure that vegetation is not cleared unnecessarily to make way for the access road and ancillary buildings.

Operations:

- » Maintain the general appearance of the facility as a whole.
- » Maintenance of roads to avoid erosion and suppress dust.

Decommissioning:

- » Remove infrastructure and roads not required for the post-decommissioning use of the site.
- » Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications.
- » Monitor rehabilitated areas post-decommissioning and implement remedial actions.

Cumulative impacts:

The construction of the solar energy facility and ancillary infrastructure will increase the cumulative visual impact of industrial type infrastructure within a rural region. The same developer is proposing another PV facility on the adjacent farm portion; therefore this will be an additive visual impact. However it also represents clustering of PV facilities in an area.

Residual impacts:

The visual impact will be removed after decommissioning, provided the facility and ancillary infrastructure is removed

Visual Impact of the Power Line

A new power line, which will be 8 km in length is proposed from the Schuitdrift Substation to the facility. The power line will have a visual impact of low significance after the use of mitigation measures.

Nature: Potential visual impact of the power lines		
	Without Mitigation	With Mitigation
Extent	Local (1)	Local (1)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Minor (1)
Probability	Probable (3)	Probable (3)
Significance	Low (21)	Low (18)
Status	Negative	Negative

Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Mitigation:		
<u>Planning:</u>		
<ul style="list-style-type: none"> » Retain and maintain natural vegetation in all areas outside the development footprint. » Plan roads and ancillary infrastructure in such a way and in such a location that clearing of vegetation is minimised. Consolidate infrastructure as much as possible. 		
<u>Construction:</u>		
<ul style="list-style-type: none"> » Rehabilitation of all construction areas. » Ensure that vegetation is not cleared unnecessarily to make way for the access roads. 		
<u>Operations:</u>		
<ul style="list-style-type: none"> » Maintenance of roads to avoid erosion and suppress dust. 		
<u>Decommissioning:</u>		
<ul style="list-style-type: none"> » Remove power lines and roads not required for the post-decommissioning use of the site. » Rehabilitate all areas. Consult an ecologist regarding rehabilitation specifications. Monitor rehabilitated areas post-decommissioning and implement remedial actions 		
Cumulative impacts:		
There are other power lines in the vicinity of the site and the Schuitdrift substation is also nearby.		
Residual impacts:		
None		

Social Impacts

The key social issues associated with the long-term operational life (more than 25 years) of the PV facility include:

- » Potential positive impacts
 - Creation of employment and business opportunities (Based on information from the developer 20 operational employment opportunities for the 20 year life of the project). The operational phase will also create opportunities for skills development and training.
 - Benefits associated with the establishment of a local community trust;
 - The establishment of renewable energy infrastructure.
- » Potential negative impacts
 - The visual impacts and associated impact on sense of place.

<i>Nature: Creation of employment and business opportunities associated with the maintenance and operations of the PV facility.</i>		
	<i>Without enhancement</i>	<i>With Enhancement</i>
<i>Extent</i>	Local and Regional (2)	Local and Regional (4)

Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (30)	Medium (56)
Status	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources?	No	
Can impact be enhanced?	Yes	
Enhancement: The developer should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's and locals employed during the operational phase of the project.		
Cumulative impacts: Should other PV facilities be developed in the region, there may be a cumulative positive impacts by creation of more jobs in the region.		
Residual impacts: Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area. See cumulative impacts		

No Go Alternative

The 'Do-Nothing' alternative is the option of not constructing the proposed Tutwa Solar Energy Facility. Should this alternative be selected then the socio-economic and environmental benefits of this renewable energy facility will not be realised. These benefits are explored in further detail in the South Africa REFIT Regulatory Guideline published by NERSA (March 2009), and include:

- » **Increased energy security,**
- » **Resource saving,**
- » **Exploitation of our significant renewable energy resource,**
- » **Pollution reduction,**
- » **Climate friendly development,**
- » **Support for international agreements,**
- » **Employment creation,**
- » **Acceptability to society and**
- » **Protecting the natural foundations of life for future generations**

In addition, the injection of an additional 16MW of energy would be beneficial to Northern Cape region. The integration of an additional 16MW should alleviate the pressure on the local grid to some extent and would contribute in a small way to meeting the government's target for renewable energy. Furthermore, implementation of the no go alternative would mean that the additional job opportunities would be lost. The No-

Go alternative is not preferred as South Africa needs to diversify our electricity sources, which this project will contribute to.

2.4. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING PHASE

Alternative (preferred alternative)

The impacts during the decommissioning and closure phases will be similar to impacts of the construction phase as discussed above.

No Go Alternative (Compulsory)

The 'Do nothing' alternative is the option of not decommissioning the proposed solar energy facility at the end of its life span.

At the end of its life span the efficiency of the facility could be reduced such that less electricity is produced. However, the additional electricity that could continue to be evacuated into the Eskom grid would be beneficial to the area. In addition, implementation of this alternative would mean that job opportunities are not lost.

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.

proposed solar energy facility. In doing so, it draws on the information gathered as part of the Basic Assessment process and the knowledge gained by the environmental consultants during the course of the process and presents an informed opinion of the environmental impacts associated with the proposed project.

The overall impact on **ecology** is likely to be of **low - medium significance** with the implementation of appropriate mitigation measures. Some loss and vegetation and faunal habitat at the site will be an inevitable consequence of the development, and cannot be mitigated, but is not highly significant in the broader context. A number of *Aloe dichotoma* trees, which is a protected species were observed within the site and a permit for their removal would be required. From a general ecological perspective, the site is not viewed as being highly sensitive. No endangered plant species were observed to occur within the proposed development area and there are no listed faunal species with a narrow distribution which occur at the site. Furthermore, outside of the drainage lines, there were no highly sensitive habitats at the site which would warrant specific avoidance or mitigation. If the mitigation measures are adequately implemented, then the development would pose little risk of creating long-term ecological degradation of the receiving environment.

The overall impact on **agricultural potential** of the site is of relatively **low significance** and the site is too small to contribute significantly to the economy or food security of the area (or the farm on which it is situated upon). The site is susceptible to both water and wind erosion. Due diligence should be observed with the implementation of proper control of water and wind erosion measures during the construction phase. Furthermore impacts from vehicles, such as spillages of oil and hydrocarbons, should be prevented and mitigated.

The overall **heritage** impact is likely to be of **low significance** with the implementation of mitigation measures. No archaeological sites with any depth of deposit or associated material and organic remains were identified within the area proposed for development. The proposed focus area for the construction of the solar facility and associated infrastructure is of a low cultural sensitivity. The Environmental Control Officer (ECO) should monitor and identify possible archaeological material remains during construction. A professional archaeologist (with an already authorised collection permit) must be appointed when possible archaeological material remains and features are found and make appropriate recommendations on removing and / or protecting the archaeological material remains and features. If concentrations of archaeological heritage material and/or human remains are uncovered during construction, all work must cease immediately and be reported to the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken. Construction managers must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

The overall **visual impact** is likely to be of a predominantly **low significance** with the implementation of appropriate mitigation measures. The construction and operational phases will have a visual impact on the visual environment especially within, but not limited to the area within 2 km of the proposed facility.

The overall **social impact** is likely to be of a predominantly **low significance (positive impact)** with the implementation of appropriate enhancement measures.

The establishment of the facility will have positive benefits as the integration of an additional ~16MW into the national electricity grid may alleviate the pressure on the local grid to a small extent and would contribute (albeit small) to the national target for renewable energy. Therefore, based on the findings of the studies undertaken, in terms of environmental constraints identified through the initial Environmental Basic Assessment process, no environmental fatal flaws were identified with the establishment of the proposed Tutwa Solar Energy Facility and associated infrastructure. Therefore, it is recommended that the project should be authorised. However, a number of issues requiring mitigation have been highlighted. Environmental specifications for the management of these issues / impacts are detailed within the draft Environmental Management Programme (EMP) included within Appendix F.

No Go Alternative (Compulsory)

Also referred to as the 'Do nothing' option, this refers to Flint Ridge Trading not constructing their proposed solar energy facility on the identified site west of Augrabies.

In this scenario the potential positive and negative environmental and social impacts as described in this Basic Assessment Report will not occur and the status quo will be maintained. In addition, the current agricultural land use will remain and the potential for harnessing solar energy will not be realised.

Should the project not proceed, the contribution of up to ~16 MW from this project towards the Government target for renewable energy will not be realised. As a result the potential local and regional socio-economic and environmental benefits expected to be associated with the proposed project would not be realised. These include:

- » *Increased energy security:* The current electricity crisis in South Africa highlights the significant role that renewable energy can play in terms of power supplementation. In addition, given that renewables can often be deployed in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality, while reducing expensive transmission and distribution losses
- » *Exploitation of our significant renewable energy resource:* At present, valuable national resources including biomass by-products, solar radiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio.
- » *Pollution reduction:* The releases of by-products through the burning of fossil fuels for electricity generation have a particularly hazardous impact on human health and contribute to ecosystem degradation.
- » *Support for international agreements:* The effective deployment of renewable energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under the Kyoto Protocol, and for cementing its status as a leading player within the international community.
- » *Employment creation:* The sale, development, installation, maintenance, and management of renewable energy facilities have significant potential for job creation in South Africa.
- » *Acceptability to society:* Renewable energy offers a number of tangible benefits to society including reduced pollution concerns, improved human, and ecosystem health.
- » *Support to a new industry sector:* The development of renewable energy offers the opportunity to establish a new industry within the South African economy.
- » *Support to local community:* Since the local community will acquire some ownership in the facility, some of the revenue generated by the facility will be utilised for upliftment of the local community.

Within a policy framework, the development of renewable energy in South Africa is supported by the White Paper on Renewable Energy (November 2003), which has set a target of 17.8 GW renewable energy contributions to final energy generation mix by 2030. The target is to be achieved primarily through the development of solar, biomass, solar

and small-scale hydro.

The 'Do nothing' alternative will not assist the South African government in addressing climate change, in reaching the set targets for renewable energy, nor will it assist in supplying the increasing electricity demand within the country. The 'Do nothing' alternative is, therefore, not a preferred alternative.

SECTION E: RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES ✓	
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If "NO," indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

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If "YES," please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

There are no insurmountable environmental or social constraints that prevent the establishment of the proposed Tutwa Solar Energy Facility. However, several sensitive areas / features were identified on the site, and are contained within this basic assessment report and are highlighted below. The following environmental and/ social features have been identified for the proposed project, that require specific management action and should be included in the Environmental Authorisation (EA) for the project, in keeping with the principles of sustainable development, and balancing environmental, social and economic needs:

SENSITIVE FEATURE	IMPLICATIONS FOR PROJECT IMPLEMENTATION TO BE INCLUDED IN EA
<ul style="list-style-type: none"> » Areas of high soil erosion sensitivity on the site. » The drainage lines represent a sensitive feature within the proposed development area. The larger drainage lines at the site are more significant and represent important habitat for fauna and flora as well as corridors for faunal movement. 	<ul style="list-style-type: none"> » Erosion control measures (as contained in the EMP) will have to be implemented during the construction of the PV facility and erosion to be monitored during the operational life of the facility. » The larger drainage lines at the site should not be built over and a 15m buffer, which would provide 30m corridors around the larger drainage lines are deemed adequate. Although a broad path which does not include and critically important areas has been defined, the actual connection route of the facility to the ESKOM network has not yet been decided and the final route of any new power lines required should be surveyed by an ecologist prior to construction on account of the presence of sensitive habitats in the area as well as listed species. Furthermore, any new power lines

	<p>should be aligned with existing lines or roads as far as possible. If the power line or development footprint traverses the drainage lines this would require a Water Use Licence from the Department of Water Affairs.</p>
<p>» The final development area should be surveyed for species suitable for search and rescue such as <i>Aloe dichotoma</i>.</p>	<p>» In terms of the Northern Cape Nature Conservation Act (Act No. 9 of 2009) a permit is required for these species for removal of these species before construction can commence, while nationally protected species are regulated by DAFF or the layout of the facility should identified avoid the protected trees, as in the ecological sensitivity map.</p>

Design, Construction, and Decommissioning Phases:

The mitigation and management measures previously listed in this Basic Assessment Report should be implemented in order to minimise potential environmental impacts. The following generic mitigation measures should also be implemented.

- » Minimise large-scale clearance of the natural vegetation and disturbance at the proposed 20 ha site.
- » Use existing and dedicated access roads to limit disturbance of the natural vegetation.
- » Minimise damage to the natural vegetation during the construction of power lines and access road.
- » Re-vegetate the disturbed areas as soon as possible with indigenous vegetation.
- » Maintenance of soil cover, the maintenance of the necessary buffer zones with a good plant cover and the correct placement of the site outside of danger and ecologically sensitive zones.
- » Minimum soil surface erosion, immediate action should be taken when negative impacts are experienced.
- » Monitor erosion rates and erosion sites on a weekly basis and after each stormwater event; monitor buffer zones for a dense grass cover.
- » Covering all access and construction routes with gravel and control of water run-off from road surfaces.
- » Care will have to be taken not to negatively impact on the drainage system. Run-off must be controlled to combat erosion and ensure that the hydrological processes in the region are not disturbed.
- » The necessary flora permits should be acquired from Northern Cape Nature Conservation in terms of the Northern Cape Nature Conservation Act and for Nationally protected species the National department of Agriculture Forestry and Fisheries (DAFF) since vegetation will be disturbed or destroyed during the construction of the proposed solar facility, power lines and access road.
- » Monitor and control the spread of declared weed and alien invasive plant species, all declared aliens must be identified and managed in accordance with the Conservation

of Agricultural Resources Act, 1983 (Act No. 43 of 1983), the implementation of a monitoring programme in this regard is recommended.

- » Before development can continue the regions need to be checked for the presence of bird nesting sites, particularly those of ground nesting species.
- » Areas of prime reptile habitat (e.g. extensive areas of flat rock, boulders fields) should be avoided. Reptiles present on the study site could potentially also be trapped and translocated.
- » Limit construction, maintenance, and inspection activities to dry periods.
- » Develop emergency maintenance operational plan to deal with any event of contamination, pollution, or spillages, particularly in riparian areas.
- » If large areas are cleared for the storage of equipment, these could be rehabilitated using arid site rehabilitation techniques such as planting cover crops reseeding with local grasses and shrubs.
- » Demarcate all areas where no impacts will be allowed, clearly marking these areas with high visibility signs, inform all contractors and construction workers to refrain from entering/ affecting these areas.
- » Prevent impacts on any surface water as a result of hazardous materials, contamination, unnecessary crossing by vehicles or personnel, extraction, drinking or other human uses, construction and maintenance activities.
- » Prevent open fires; provide demarcated fire-safe zones, facilities, and fire control measures.
- » Fire fighting equipment shall be made available on all vehicles and at various suitable points within the development site.
- » Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. If concentrations of archaeological heritage material and human remains are uncovered, all work must cease immediately and be reported to SAHRA so that systematic and professional investigation/ excavation can be undertaken.
- » Appoint an Environmental Control Officer (ECO).
- » The ECO should monitor and identify possible archaeological material remains during construction. A professional archaeologist (with an already authorised collection permit) must be appointed when possible archaeological material remains and features are found and make appropriate recommendations on removing and / or protecting the archaeological material remains and features.
- » Compile and implement a detailed waste management plan.
- » Compile and implement a storm water management plan.

Operation Phase:

The mitigation and management measures previously listed in this Basic Assessment Report should be implemented in order to minimise potential environmental impacts. The following generic mitigation measures should also be implemented.

- » Use and maintenance of erosion control measures, where deemed necessary.
- » Development and implementation of a stormwater management plan.

Is an EMPR attached?

YES ✓

The EMPR must be attached as **Appendix F**.