



Final Basic Assessment Report

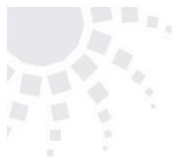
**Proposed 18 -20 MW Ruimte Photovoltaic (PV)
Power Facility, Free State**

Solar Reserve Southern Africa (Pty) Ltd

DEA Ref: 14/12/16/3/3/1/469

May 2012

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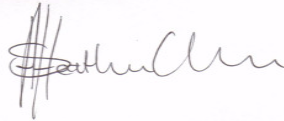
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ERM Reference: 0151464

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For and on behalf of
Environmental Resources Management

Approved by: Stuart Heather-Clark



Signed:

Position: Partner

Date: 17 May 2012

This report has been prepared by Environmental Resources Management the trading name of Environmental Resources Management Southern Africa (Pty) Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

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environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

(For official use only)

File Reference Number:

Application Number:

Date Received:

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

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **tick** the boxes that are applicable 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.
11. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

SECTION A: ACTIVITY INFORMATION

<p>Has a specialist been consulted to assist with the completion of this section? Specialist reports were compiled for the development of a 150 MW facility on the site and these reports were used to inform the Basic Assessment (BA) for this solar PV facility.</p>	<p>YES ✓</p>	<p>NO</p>
<p>If YES, please complete the form entitled "Details of specialist and declaration of interest" for appointment of a specialist for each specialist thus appointed:</p>		
<p>Any specialist reports must be contained in Appendix D.</p>		

1. ACTIVITY DESCRIPTION

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

<p>Solar Reserve is planning a new solar photovoltaic (PV) power facility for the generation of solar energy in the Free State. The proposed PV power facility is located on Wagenmakersdrft (Subdivision 1 of Farm No. 24), in the Letsemeng Local Municipality and Xhariep District Municipality, Free State. (see Appendix A). The site is located approximately 14 Kilometres (km) north east of Koffiefontein and is accessible from the R705 (tarred road).</p> <p>The proposed development includes the installation and operation of solar panels (photovoltaic (PV) arrays) with a projected output of between 15-18 megawatts (MW). The proposed development site is less than 20 hectares (ha).</p> <p><u>PV power facility and PV Generation:</u></p> <p>Solar energy systems produce energy by converting solar irradiation into electricity or heat. For the proposed PV power facility, Solar Reserve will utilise photovoltaic (PV) technology to generate electricity. PV technology consists of the following components:</p> <ul style="list-style-type: none"> • PV cell: a basic photovoltaic device, which generates electricity when exposed to solar radiation. The absorbed solar energy excites electrons inside the cells and produces electrical energy. The PV cells are commonly constructed from polycrystalline silicon. All photovoltaic cells produce direct current (DC). • PV module or panel: the smallest complete assembly of interconnected photovoltaic cells. In the case of polycrystalline silicon cells - following testing and sorting to match the current and voltage, the cells are interconnected and encapsulated between a transparent front (usually glass) and a backing material. The module is then typically mounted in an aluminium frame. • PV array: a mechanically integrated assembly of modules and panels together with support structure to form a direct current power producing unit. The proposed PV
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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.

power facility will consist of antireflective modules arranged in numerous arrays. The feeding of electricity into the grid requires the transformation of DC from the PV array into alternating current (AC) by an inverter.

Project Components:

It is anticipated that the project will feed between 15-18MWs into Eskom's national grid. The key components of the proposed PV power facility include the following, which are discussed in more detail below:

- PV panels/modules (arranged in arrays);
- PV module mountings;
- DC-AC current inverters and transformers;
- New grid connection substation;
- Underground cabling and very short overhead power lines from existing lines to new substation
- On-site buildings (including an operational control centre, office, ablutions and a guard house); and parking for approx. 10 vehicles
- Hydrocarbon storage area;
- Access roads and internal road network; and
- Ancillary infrastructure.

An indicative site layout has been developed and this is shown in Appendix A.

PV Arrays and Mountings:

The proposed development will include PV panels that will occupy a combined area of up to 18ha of the site area. The panels will be situated in rows extending across the BA site area. The collective term for a series of PV panels in rows is a PV array. A PV panel is typically 15m² in size and the rows will be approximately 1km in length, made up of approximately 100m sections depending on the final design and layout of the development. There will be approximately 65 000 PV panels on the site.

The panels will be mounted on metal frames with a maximum height of approximately 2m above the ground, supported by concrete or screw pile foundations, and they will face north in order to capture the maximum sunlight. As mentioned above, the facility will comprise fixed structures and the PV solar panels will therefore remain stationary. The estimated power output of a PV panel is 280 Watts (W) and a total installed capacity of 18MW, is anticipated.

Electrical Connections and Controls:

The rows of PV panels will be connected to an internal electrical collection system, which is likely to be a single transmission line slung overhead between each PV array. An inverter will be connected to each row of PV panels to convert the direct current (DC) output to alternating current (AC). The inverters will connect to a number of step-up transformers, which will convert the low voltage AC to a medium voltage suitable for the internal collection system (probably 11 or 22 kV). There will be 8 to 10 inverters each with a 2MW capacity and will be approximately 2m in height above the ground. The main transformer and distribution transformers have an estimated capacity of 2MVA and

20MVA respectively with an approximate height of 2m.

A medium voltage collection system will then transport the electricity to a substation which will connect the facility to the national grid via an existing 132kV overhead transmission line. The medium voltage collection system may include some minor stretches of overhead connection lines if the distance or terrain dictates. The proposed new substation will be located in close proximity to the existing 132kV transmission line and will have an estimated capacity of between 33kV to 275kV. The substation would incorporate an area of up to 250m² in size and would include a control room, operations and maintenance facility, parking, external 132kV transformers, electrical switchgear and would be fenced for security and safety reasons.

A low voltage internal electric grid will be installed for powering the site facilities such as the office, storage facilities and control room (the facility will therefore provide it's own operating power).

Grid Connection

The electricity generated will be fed into the national grid at the substation to be built on site. This interconnection line transverses the site and will have a maximum voltage of up to 132kV. The length and position of the line will depend on which alternative is most preferred.

Access Road - The site will be accessed via the R705. It is intended that there will be an additional access road to the site in the south west; however, the final location of this access road is subject to change depending on the outcome of the BA. Within the site area existing farm tracks will be up-graded and new gravel roads may be constructed to facilitate movement of construction and maintenance vehicles. There will be an access track adjacent to each row of the PV array as well as tracks between the other components of the development. Site access roads that are developed will be approximately 4m wide with drainage trenches adjacent to the road. PV power facility maintenance will consist mainly of PV panel replacement, PV panel cleaning and other minor mechanical and electrical infrastructure repairs. Access will be needed primarily for light service vehicles entering the site for maintenance, inspection and PV panel cleaning purposes.

Between PV arrays, a minimum spacing of approximately 3m is required between each row to avoid shadowing of the panels by adjacent rows. These spaces will not be gravelled or paved.

Auxilliary Electrical Equipment

The following additional electrical equipment will be required for the project:

- A 200 kVA (10MW) diesel generator will supply power to security and monitoring systems in the event of a grid failure;
- Security system, electrical fence and 24 hour on site security access control;
- Fire detection system;
- Weather monitoring equipment (rainfall, wind speed/direction, solar irradiation, air moisture) will be located on site near office structures or other appropriate safe

position

- PV power facility monitoring equipment and associated telecommunication links will be located inside the office structures
- Air conditioning equipment inside inverter/transformer enclosures which will regulate the operating temperature of the inverters.

Additional Infrastructure:

Additional infrastructure that will be required for the project includes the following:

- a permanent solar irradiation measuring panel (approximately 16m² in size) will be erected to collect data on the solar resource at the site;
- a water deionisation unit not larger than 15m by 15m.
- storage area for oil and hydrocarbons with a capacity not exceeding 500m³.
- a small site office and storage facility, including security and ablution facilities(750m²);
- site fencing (2m to 5m in height);
- car park (not paved);
- accommodation (for 4-5 people) to facilitate shift staff structures ; and
- a lay-down area for the temporary storage of materials during the construction activities (100 by 100m).

Water will be purchased from the nearest most appropriate and DWA authorised water user. During operations it is expected that subject to the appropriate permissions, current abstraction limits and water quality, boreholes will be used for the water required for ablution facilities and for periodic cleaning of the solar panels during operations. It is expected that approximately 550,000 litres of water will be required per year during the operational phase of the facility and 1.9 million litres during the construction phase.

Should a borrow pit be required this would not be located within any sensitive areas identified and would be rehabilitated at the end of construction using surplus material excavated from foundations or other site excavations. The size of this pit would depend on the terrain, suitability of the subsurface soils and the requirement for granular material for access road construction and other earthworks. Should this be necessary, the relevant permits will be obtained prior to establishment of the borrow pit.

Project Stages and Activities:

The project life-cycle can be divided into three key stages as follows:

- site preparation and construction;
- operation (including maintenance and repair); and
- decommissioning.

Each of these stages is outlined in the sections below.

Site Preparation and Construction

Prior to construction of the PV power facility, the site will be prepared. The 20ha site is generally flat and low lying. Site preparation activities will include the following activities:

- vegetation clearance – removal or cutting of any tall vegetation if present (bush cutting);
- levelling and grading of areas where the PV arrays will be sited to remove steep slopes and undulations where these would normally occur (this is not deemed necessary given the flat nature of the terrain on the site) ;
- levelling of hard-standing areas e.g. for temporary laydown and storage areas;
- erection of site fencing;
- construction of temporary construction camp; and
- upgrading of farm tracks/ construction of on-site access roads.

Once the site has been prepared, prior to the installation of the PV components, the following construction activities will take place:

- installation of fixed structures to support the PV panels; (sometimes referred to as modules)
- construction of the new grid connection substation;
- construction of electrical and control room;
- construction of site office and storage facilities, including security and ablution facilities and associated septic tanks;
- Installation of water deionisation unit;
- construction of array enclosure and inverter/transformer foundations and housing; and
- installation of cables.

The PV, electrical and structural equipment will be procured in South Africa where available, alternatively from an international manufacturer if sourcing from within the country is not possible. It is expected that these components will be delivered to site via road in small trucks. Once the PV components have arrived on site, technicians will supervise the assembly of the panels and test the facility. The PV panels will be installed on the fixed structures anchored to the ground through poles which will be screwed or piled into the ground.

Operation

Once each phase of the facility is complete and operational it is expected that it will have a lifespan of at least 20 years. Measuring the performance of the PV power facility will be done remotely, through the use of a monitoring system. Day to day facility operations will involve both regular on site preventive and corrective maintenance tasks in order to keep the PV power facility in optimal working order throughout the operational period. Maintenance will consist mostly of PV panel replacement and other mechanical and electrical infrastructure repairs. Intermittent cleaning of the PV panels

will be carried out as necessary which is anticipated to be once or twice a year. Faulty components will be replaced as soon as problems are identified.

During the operations phase the PV facility would be able to operate in conjunction with some current site activities such as grazing of small livestock.

Decommissioning

The PV power facility will after 20-30 years either be decommissioned, upgraded or an application submitted to obtain a new license. Solar Reserve intend for the salvage value of the PV power facility to cover the cost of decommissioning. Should the facility be decommissioned, the PV power facility will be rehabilitated to its original state:

- PV panels will be removed from the fixed aluminium frames.
- Fixed aluminium frame structures will be removed.
- PV panels will be transported to special recycling facilities (alternatively used at other operational sites).
- Electrical equipment (transformers) will either be re-used on other developments/projects, or sold.
- Underground cable runs (where applicable) will be removed.
- Gravel/chipstone on the access roads, onsite service roads, guardhouse foundations will be removed.
- Buildings, such as the guardhouse can be taken over by the landowner for operational purposes, alternately all the reusable material can be removed, the shells demolished and the rubble transported to a municipal waste site.
- Disturbed land areas will be rehabilitated, and replanted with indigenous vegetation if required.

2. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

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

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

Technology Alternatives:

Fixed Mounted PV System (Preferred alternative)

A fixed mounted PV system has PV panels installed at a set angle (tilt), with the PV panels unable to move.

The fixed mounted PV system has been selected as the preferred alternative over a tracking system as it has the following advantages:

- Mechanical simplicity, and hence lower installation and ongoing maintenance costs.**
- The fixed mounted PV system is a tried and tested technology which decreases the risks associated with equipment failure and the cost of obtaining new parts, especially considering the site is located in a remote area.**
- Wind loading capacity: fixed mounted PV systems are able to withstand stronger winds. All PV structure mounts other than fixed flush-mounted PV panels must be carefully designed to take into consideration the level of wind exposure the PV panels will have to cope with. This is more difficult and expensive with a tracking system while fixed mounts are cheaper and easier to install.**

It is also important to note that 10 percent of solar incident radiation is diffuse light (light that is reflected from other objects), which is captured by the fixed mounted PV system even though it does not have tracking capability. The fixed mounted PV system can therefore tolerate misalignment. The effective solar incident radiation collection area for a flat-panel is relatively insensitive to quite high levels of misalignment with the sun –for example even a 25° misalignment reduces the direct solar energy collected by less than 10%.



Figure 1: On the left hand side: Fixed Structures, On the right hand side: Rotating/ tracking system

Dual axis tracking

Tracking systems are PV structures or mountings that rotate to follow ('track') the Sun's movement. Single axis trackers track the Sun east to west, while a two-axis tracker tracks the daily east to west movement of the Sun and the seasonal declination movement of the Sun. This technology utilizes electric motors, mechanical parts and solar irradiation sensors to follow the movement of the Sun ensuring that more light comes into contact with the PV panels.

Although a tracking system is designed to capture maximum sunlight, it is a relatively new technology and is deemed by Solar Reserve not currently a feasible technology option in South Africa for the following reasons:

- **High level of maintenance:** The tracking system requires a high level of maintenance due to its many components and its moving parts. The parts need to be replaced regularly by a qualified technician. As the PV power facility will be located in a rural area, approximately 40km from the closest town, it would prove difficult to constantly send a technician out to the site as the site is not easily accessible.
- **Greater Cost:** Due to the constant high level of maintenance required, and the higher cost of the parts of the tracking system, the total cost of the tracking system is much higher than that of the fixed PV panel structure.
- **Greater surface area:** PV systems are mounted with sufficient spacing between the structures such that there is minimal shading between the different units and onto the PV panels. Due to the PV array moving with a tracking system, this implies that greater space is needed between the units so that intershading is still minimized. The result is that more land is needed per number of PV arrays compared to that of a fixed system.
- **Power consumption:** The motor attached to the tracking system requires a power source. The power consumption would need to be deducted from the total power produced by the PV power facility to ascertain the final total output of the PV power facility.

It is for the reasons discussed above, as well as the lack of environmental impact difference between the two technology alternatives, that the fixed mounted PV system has been chosen as the preferred technology alternative and will not be discussed further in the Basic Assessment Report (BAR.)

Layout Alternatives (PV Panel area alternatives):

Three areas on the site have been identified as site layout alternatives. The map below indicates these three areas. These areas have been chosen as they avoid the sensitive areas as identified by the specialists and allows easy access from the on site road network.

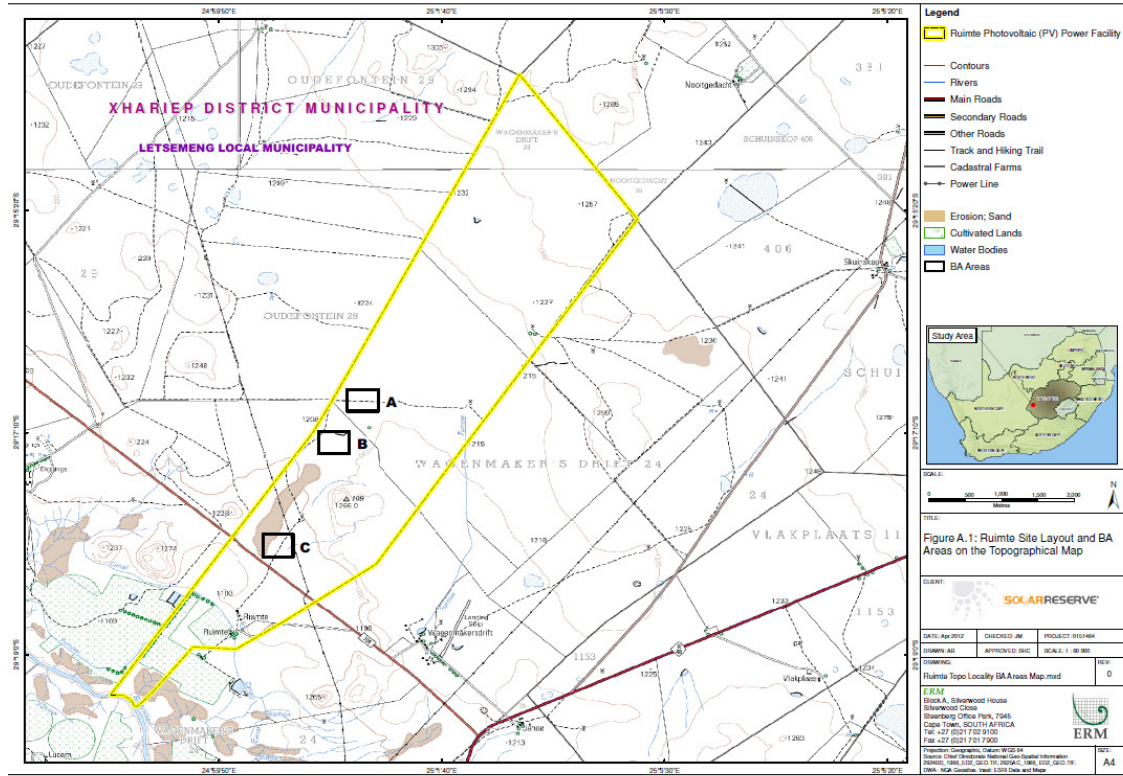


Figure 9: Topographical map showing Alternative A, Alternative B and Alternative C.

Alternative A (preferred alternative-S1)

Site Layout A is located within the northern section of the site and it is located north of both Site Layout B and Site Layout C. Site Layout A is the preferred alternative as it has the least impact on ecological sensitive areas as well as causing the least visual impact.

Site Layout A, is located furthest from the R705 and its behind the northern on site koppie thereby minimizing the visual impacts associated with PV power facility.

Furthermore, Site Layout A is not located close to ecological sensitive areas.

Alternative B (less preferred alternative-S2)

Site Layout B is the less preferred alternative as the PV power facility would cover very sensitive ecological areas and the visual impacts would be less with Alternative A. Site Layout B is located within the western border of the site and it south of Site Layout A and north of Site Layout C. Site Layout B is located within and close to very high and high ecological sensitive areas.

Alternative C (least preferred alternative-S3)

Site Layout C is the least preferred alternative as it has the greatest visual and ecological impacts. Site Layout C is located south of Site Layout B and Site Layout A. It is located the closest to the R705, compared to Site Layout B or Site Layout A and thus it is the most visible from R705, thereby causing the greatest visual impact.

Additionally, Site Layout C is within ecological areas classified as very high and high.

No-Go Alternative

The no-go alternative implies that the proposed project would not be executed. Assuming that the solar power plant would not be developed at the proposed site, there would be no increase in electricity generation from the facility, no CO2 offsets associated with the proposed development, no economic benefit to the landowners associated with the potential income generated through the operation of the facility and there would be no contribution to meeting South Africa’s targets for renewable energy generation. Should the solar power plant not be developed the agricultural potential of the site would not be lost due to the establishment of the facility on agricultural land. There would also be no negative environmental and social impacts associated with the development of a solar power plant.

3. ACTIVITY POSITION

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

List alternative sites, if applicable.

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 ² (preferred or only site alternative) Site Layout A	29° 16' 53.93" S	25° 1' 1.08" E
Alternative S2 (if any) Site Layout B	29° 17' 14.72" S	25° 0' 46.82" E
Alternative S3 (if any) Site Layout C	29° 18' 5.79" S	25° 0' 19.14" E

In the case of linear activities:

Alternative:	Latitude (S):	Longitude (E):																								
Alternative S1 (preferred or only route alternative)																										
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² "Alternative S.." refer to site alternatives.

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

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0	'	0	'

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

4. PHYSICAL SIZE OF THE ACTIVITY

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

The size of the activity would be similar for each layout alternative although the length of connecting overhead power lines or access roads would differ.

Alternative:	Size of the activity:
Alternative A1 ³ (preferred activity alternative)	Less than 20ha (200 000m²)
Alternative A2 (if any)	m ²
Alternative A3 (if any)	m ²
or, for linear activities:	
Alternative:	Length of the activity:
Alternative A1 (preferred activity alternative)	m
Alternative A2 (if any)	m
Alternative A3 (if any)	m

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

Alternative:	Size of the site/servitude:
Alternative A1 (preferred activity alternative)	18ha (180 000m²)
Alternative A2 (if any)	m ²
Alternative A3 (if any)	m ²

5. SITE ACCESS

Does ready access to the site exist?	YES ✓	NO
If NO, what is the distance over which a new access road will be built		
Describe the type of access road planned:		
<p>The proposed PV Solar Power Plant requires the construction of access roads to the site and between the Solar PV panels for maintenance purposes. There is no road reserve and it is expected that the proposed roads will be 4 metres wide, which will be accessible via the R705.</p> <p>Within the PV arrays, a minimum spacing of 3m is required between each row to avoid shadowing of the panels by adjacent rows. These spaces will not be gravelled or paved. Access to the site will be needed primarily for light service vehicles entering the site for maintenance, inspection and PV panel cleaning purposes.</p>		

³ "Alternative A.." refer to activity, process, technology or other alternatives.

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

6. SITE OR ROUTE PLAN

Included in Appendix A

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 plan is contained 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.

See site photographs in 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.

The facility illustration is attached in Appendix C

9. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 400 Million	
What is the expected yearly income that will be generated by or as a result of the activity?	Dependant on the tariff. Approximately R 40-70 million	
Will the activity contribute to service infrastructure?	YES	NO ✓
Is the activity a public amenity?	YES	NO ✓
How many new employment opportunities will be created in the development phase of the activity? Note: Numerous local employment opportunities will be created in the manufacturing process of solar panels, steel frames, etc.	Up to 60 full time employees during construction (6 months)	
What is the expected value of the employment opportunities during the development phase?	R 1.5 million	
What percentage of this will accrue to previously disadvantaged individuals?	40 to 75% as approx. 20 % will need to be skilled and experienced	
How many permanent new employment opportunities will be created during the operational phase of the activity?	10 to 20 full time employees during operation	
What is the expected current value of the employment opportunities during the first 10 years?	R 40 million variable depending on engineering contractor but guided by dept of energy Compliance guidelines	
What percentage of this will accrue to previously disadvantaged individuals?	25 to 75% depending on revised dept of energy compliance guidelines and contractor	

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	YES	NO

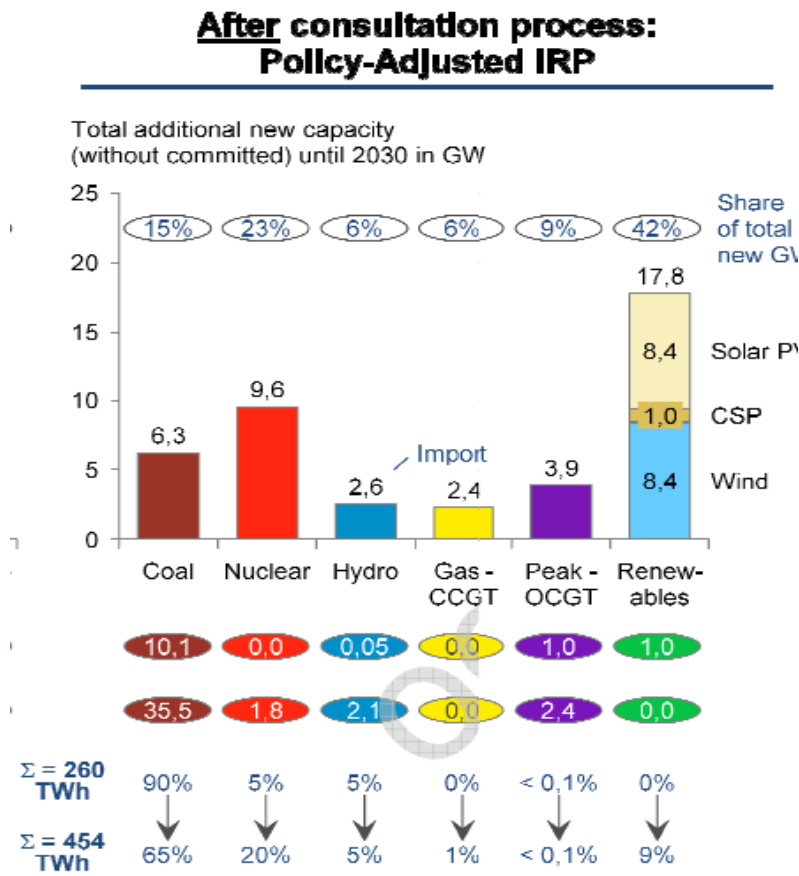
	application? The rezoning/departure application will be undertaken after the application for environmental authorization has been processed. The relevant authorities are included on this application's stakeholder database (see Appendix G).	✓	
2.	Does the proposed land use fall within the relevant provincial planning framework?	YES	NO ✓
3.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation: Solar farms, being a relativity new development type in South Africa and in the Free State, were not taken into consideration at the time when planning frameworks were formulated. This development type is expected to be represented in these documents in due course. The Free State Provincial Planning Department Local Municipality and Department of Agriculture will be engaged and invited to comment on the proposed development.		

DESIRABILITY:			
1.	Does the proposed land use / development fit the surrounding area?	YES	NO ✓
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	YES	NO ✓
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES ✓	NO
4.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation: Solar farms, being a relativity new development type in South Africa and in the Free State was not taken into consideration at the time when structure plans and planning visions were formulated. This development type is expected to find its way into these documents in due course. The potential for the Free State to become a hub especially for the generation of electricity through solar energy is recognized by the Free State Development Corporation (FDC) FDC is promoting solar related projects in the region. The renewable energy sector, especially the solar sector is a key focus of the FDC (http://issuu.com/globalafricanetwork/docs/freestatebusiness#download) The proposed PV power facility is located in an agricultural area and other than occasional sheep grazing; other farming activities will not be possible within the footprint of the PV power facility, as the PV array area will be fenced off Additionally, an EIA process is being undertaken for an additional 150MW PV power facility on the site. However, cattle and sheep farming activities will still continue on the Ruimte farm.		
5.	Will the proposed land use / development impact on the sense of place?	YES ✓	NO
6.	Will the proposed land use / development set a precedent?	YES ✓	NO

7.	Will any person's rights be affected by the proposed land use / development?	YES	NO ✓
8.	Will the proposed land use / development compromise the "urban edge"?	YES	NO ✓
9.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.		
	<p>The proposed solar farm will be situated in an arid, rural environment. The solar power plant may affect the rural feel of the area,</p> <p>The PV power facility will set a precedent as once it is established, it may encourage further PV power facility developments in the area by other developers/ farm owners.</p> <p>Additionally, the establishment of the PV power facility may set a legal precedent within the area indicating these types of development are possible.</p>		

BENEFITS:			
1.	Will the land use / development have any benefits for society in general?	YES ✓	NO
2.	<p>Explain:</p> <p>The intentions of Solar Reserve in establishing a PV power facility include reducing South Africa's dependence on non-renewable fossil fuel resources, contributing towards the targets and goals the South African government has set out, and contribute to climate change mitigation.</p> <p>The South African government has developed a policy framework (the White Paper on Renewable Energy) and set a target of sourcing 10,000 GWh from renewable energy projects by 2013. This amounts to approximately 4 percent of South Africa's total estimated energy demand by 2013. At the Copenhagen Conference in December 2009 South Africa's president also set a target for the reduction of CO₂ emissions, as laid out in the Integrated Resource Plan (IRP 2010) which sets a target reduction of CO₂ emissions by 34 percent by 2020. The utilisation of renewable energy will play a major role in achieving this goal. South Africa's commitment to achieving this goal was reiterated by Minister Edna Molewa at the December 2010 Climate Change Conference in Cancun, Mexico. At present, South Africa generates approximately 77 percent of its power consumed from coal and as a country, South Africa is among the largest emitters of CO₂ globally.</p> <p>The Renewable Energy Independent Power Procurement Programme (IPP Procurement Programme) has been designed for the following reasons: allowing the private sector to contribute to the generation of renewable energy (and the target set by government), contributing towards socio-economic and environmentally sustainable growth, and enhancing the renewable energy sector in South Africa.</p> <p>Applicants are allowed to submit a proposal for the finance, construction, operation and maintenance of renewable energy facilities. Figure 10 illustrates the</p>		

total new additional energy capacity needed by 2030, and the different sources of this additional energy.



Source: DoE, March 2011

Figure 10: Cabinet Approved Energy Contribution for South Africa from 2010 to 2030.

Due to the small scale nature of this development, the significance of this positive impact is considered low, however, the cumulative impact of this 10 MW development as well as the proposed 150MW PV power facility application occurring in conjunction with this 18MW application, and the numerous other proposed solar power facilities in the area may prove significant.

Beyond the positive climate impact however, solar energy is very well placed to rapidly come on line and contribute to alleviating the power gap in South Africa. Emergency load shedding in South Africa during 2007 and 2008 highlighted the challenges facing South Africa in terms of electricity generation, transmission and distribution. The National Energy Response Plan (NERP), drafted at the time, acknowledged the role that independent power producers (IPPs) (including those harnessing renewable energy resources) can play in ensuring sustainable electricity generation, and sets a goal that 30 percent of all new power generation will be derived from IPPs .

3.	Will the land use / development have any benefits for the local communities where it will be located?	YES ✓	NO
4.	<p>Explain:</p> <p>The development of solar energy in the Free State offers the opportunity for a new industry in the province. Existing levels of unemployment are high within the province and especially within Koffiefontein.</p> <p>It is expected that 40-60 employment opportunities will be created during the construction phase and 12 - 16 local employment opportunities will be associated with the operational phase of the development.</p> <p>Employee training will also provide individuals with new skills that are desirable in the renewable energy sector in South Africa. As the renewable energy industry and specifically, the solar energy sector, develops potential employment opportunities available to these skilled individuals will increase. Therefore, even after the construction/ operation phase of the development has ended, the local community will still benefit due to their newly acquired skills.</p> <p>The conditions of contract between Solar Reserve and the Subcontractors will include requirements for local Enterprise Development, thereby creating additional opportunities within the manufacturing sector.</p> <p>The landowner will receive payment for the use of their land during the operational phase resulting in an additional source of income for the farm.</p> <p>A local community trust is intended to be set up for the area and a portion of Solar Reserve's gross profits before tax and depending on the project stage will be donated to the Trust.</p>		

10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administering authority:	Date:
National Environmental Management Act (107 of 1988), as Amended	Department of Environmental Affairs	1998
Occupational Health and Safety Act 85 of 1993	Department of Labour	1993
Hazardous Substances Act 15 of 1973	Department of Health	1973
National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004)	Department of Environmental Affairs	2004
Conservation of Agricultural Resources Act (Act 43 of 1983)	Department of Agriculture	1983

11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES✓	NO
If yes, what estimated quantity will be produced per month?	15m ³ (spoil material, packaging and building rubble)	
How will the construction solid waste be disposed of (describe)?		
<p>All wastes that cannot be reused or recycled will be collected by approved waste contractors and transferred to an appropriately licensed waste management facility for treatment and disposal. The contractor shall remove refuse collected from the working areas at the site at least once a week. Furthermore, all builders' rubble generated during the construction phase shall be removed from the site regularly to a licensed landfill site. Packaging material (wooden pallets and cartoons, cable rests) will be recycled as far as</p>		
Where will the construction solid waste be disposed of (describe)?		
<p>All builders' rubble generated during the construction phase will be removed by approved waste contractors from the site regularly to an appropriately licensed landfill site.</p>		
Will the activity produce solid waste during its operational phase?	YES✓	NO
If yes, what estimated quantity will be produced per month?	Less than 20m ³ per month	
How will the solid waste be disposed of (describe)?	The solid waste will be removed from the site and will feed into a municipal waste stream.	
Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?		
<p>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.</p>		
Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	YES✓	NO
<p>The PV panels contain micron sized amounts of cadmium telluride (CdTe) which is classified as hazardous waste. Once the PV panels have reached the end of their life cycle, the manufacturer of the PV panels will collect and recycle the PV panels and recover any hazardous substances in the PV modules. This provision forms part of the supply agreement between Solar Reserve and the selected PV panel manufacturer. This reduces the risk of the CdTe impacting on human health or the environment.</p>		

<p>If yes, inform the competent authority and request a change to an application for scoping and EIA.</p> <p>As the hazardous waste quantities that will be produced during the construction phase are minimal a Scoping/ EIA application is not applicable. The hazardous waste to be produced on site does not trigger the following listed activity from the Waste Act (2009): <i>“The storage including the temporary storage of hazardous waste at a facility that has the capacity to store in excess of 35m³ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons.”</i></p>		
Is the activity that is being applied for a solid waste handling or treatment facility?	YES	NO✓
<p>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.</p>		

11(b) Liquid effluent

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

YES	NO✓
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If yes, what estimated quantity will be produced per month?

m ³	
Yes	NO✓

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

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

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

YES	NO✓
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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:

The PV panels will be cleaned once or twice a year to remove dust accumulated on the surfaces of the modules during the operational phase of the project. It is expected that water use will be minimal during the operational phase:

- 300 000 litres for washing; and
- 250 000 litres for domestic use.

The water used for cleaning will not contain any harmful chemicals or additives and will not be heated. Therefore the water is not regarded as wastewater and the water will be allowed to percolate into the soil.

During the operational phase it is the intention of Solar Reserve to source the required water from an existing reticulation system, either from the local municipality or the landowner. If this is not feasible, alternative options would be to tanker in the required water and / or amend the existing landowner's water use license via application to the appropriate authority to include the activity of the required water use.

Two million litres of water will be used in the construction phase.

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	YES	NO ✓
If yes, is it controlled by any legislation of any sphere of government?	YES	NO
If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.		
If no, describe the emissions in terms of type and concentration: The operation phase of the proposed solar power plant does not produce any emissions such as carbon dioxide, sulphur dioxide or any other substances or particles that are harmful to the environment. PV technology is a clean source of energy, in this respect and one of the positive impacts associated with the proposed development is the reduction in greenhouse gas emissions.		

11(d) Generation of noise

Will the activity generate noise?

YES ✓	NO
YES	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:

During the construction phase construction vehicles including excavation equipment and trucks may produce a noticeable increase in noise disturbance. Construction vehicles may create some additional noise and vibration along access routes. The site however, is located in a rural setting with few or no receptors considered sensitive within close proximity to the site.

Noise levels during operation are minimal. Noise associated with maintenance activities may create some disturbance but this will be low level and localized.

12. WATER USE

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

municipal ✓	water board (Local Water User's Association)	groundwater (On-site borehole during operation)	river, stream, dam or lake	Other ✓ The applicant will be trucking in water with purchase agreement from localised user or the municipality, as advised by Department of Water Affairs.	the activity will not use water
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

YES	NO ✓

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

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

The project intends to purchase water from the most appropriate and approved water licence holder. However as the project progresses past preferred bidder status and if required by DWA a water use license application will be submitted to utilise on site borehole sources of water.

13. ENERGY EFFICIENCY

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

The PV panels are predesigned and will be installed by the applicant. Any design measures for energy efficiency would not be applicable at this stage. The facility will generate energy which will feed into the national grid as opposed to using energy.

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

Not applicable. See comment above.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

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

3. Has a specialist been consulted to assist with the completion of this section?	YES ✓	NO
If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed:		
All specialist reports must be contained in Appendix D. Specialist studies are being conducted in preparation for an EIA for a larger PV development and their assessment areas include the area ear-marked for this development. Specialist reports are included in Appendix D.		

Property description/physical address:	The site is located approximately 14km north of Koffiefontein and is accessible from the R705. The total farm area is 1769ha. The landscape of the site and surrounds is relatively flat with surrounding koppies.
	(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.
	The proposed solar power plant is located on Farm Wagenmakersdrft (Subdivision 1 of Farm No. 24), situated in the Letsemeng Local Municipality in the Free State.
	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:	Agricultural The site is designated for agricultural use, with current agricultural practices including sheep and cattle farming as well as irrigation farming to the south west of the site. Land use in the surrounding area includes further sheep and cattle farming, as well as irrigation practices to the south of the site along Riet River. It is worth noting that the postions of the PV plant on the farm are not under irrigation
	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✓	NO
Must a building plan be submitted to the local authority?	YES✓	NO
Locality map:	<p>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:</p> <ul style="list-style-type: none"> • 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) 	

A detailed site plan including a locality map is attached in Appendix A.

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50✓ 1:20	–	1:20 1:15	–	1:15 – 1:10	1:10 1:7,5	–	1:7,5 – 1:5	Steeper than 1:5
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Alternative S2 (if any):

Flat	1:50 1:20	–	1:20 1:15	–	1:15 – 1:10	1:10 1:7,5	–	1:7,5 – 1:5	Steeper than 1:5
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Alternative S3 (if any):

Flat	1:50 1:20	–	1:20 1:15	–	1:15 – 1:10	1:10 1:7,5	–	1:7,5 – 1:5	Steeper than 1:5
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2. LOCATION IN LANDSCAPE

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

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

2.8 Dune
2.9 Seafront

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO ✓	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO ✓	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES ✓	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO ✓	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO ✓	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO ✓	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO ✓	YES	NO	YES	NO
An area sensitive to erosion	YES	NO ✓	YES	NO	YES	NO

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

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

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

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

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

An Ecology Specialist has been appointed to undertake an assessment of the condition of the vegetation at the proposed site. According to the specialist report, alien plants were observed around the watering points and other disturbed areas. The alien species observed by the specialist include: *Opuntia ficus-indica*, *Conyza bonariensis*, *Datura stramonium* and *Tagetes minuta*.

The site contains three vegetation types, namely Northern Upper Karoo, Kimberley Thornveld and Vaalbos Rocky Shrubland (Figure 1). All three vegetation types have not been heavily impacted by intensive agriculture or mining and are all classified as Least Threatened. Within the context of the site, the Vaalbos Rocky Shrubland unit is deemed the most sensitive as it is associated with the rocky outcrops and represents habitat not found elsewhere on the site. The Kimberley Thornveld unit is deemed, at a broad-scale to be more sensitive than the Northern Upper Karoo, because those areas dominated by Kimberley Thornveld contains numerous large trees, while the Northern Upper Karoo is much more open and dominated by low bushes and grasses with scattered individuals or clumps of trees. Although the vegetation map has been produced at a relatively coarse scale, it reflects the distribution of vegetation types at the site reasonably well. Some small rocky outcrops and a small pan which are not reflected on the vegetation map were however observed at the site and have been mapped as part of the sensitivity mapping.

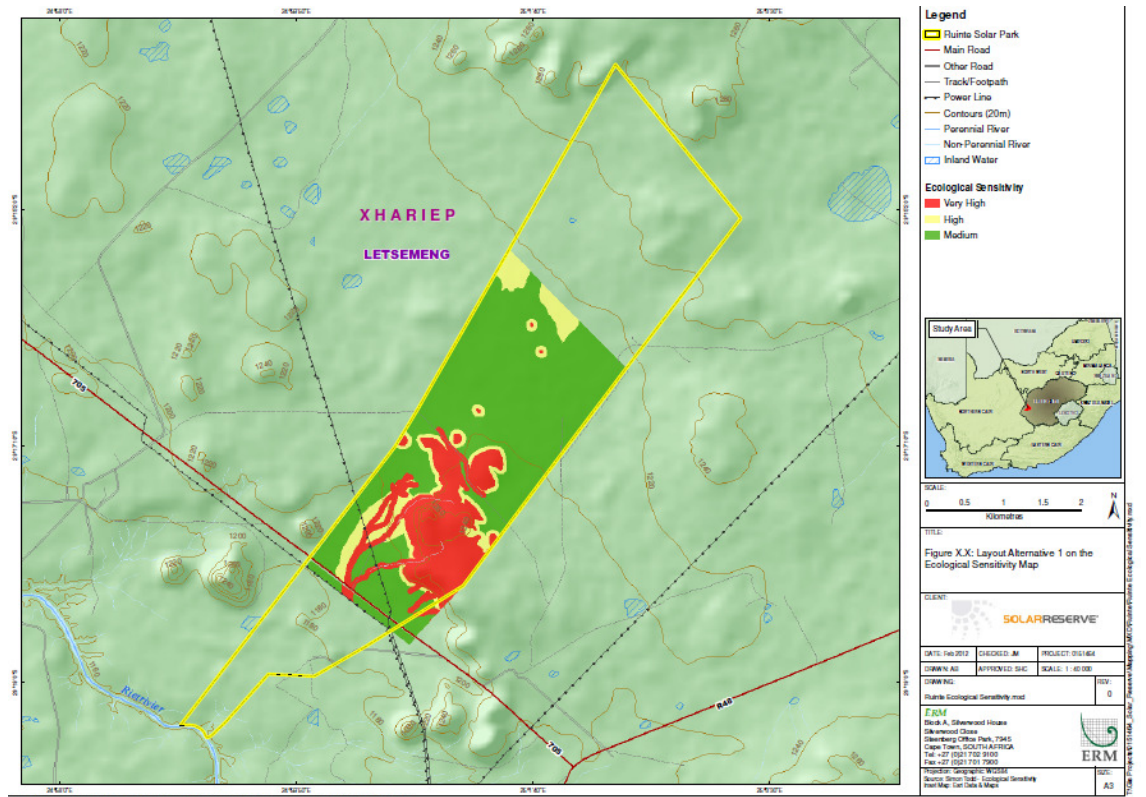


Figure 11: Ecological Sensitivity map

5. LAND USE CHARACTER OF SURROUNDING AREA

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

5.1 Natural area ✓

5.2 Low density residential ✓

5.3 Medium density residential

5.4 High density residential

5.5 Informal residential^A

5.6 Retail commercial & warehousing

5.7 Light industrial

5.8 Medium industrial^{AN}

5.9 Heavy industrial^{AN}

5.10 Power station

5.11 Office/consulting room

5.12 Military or police base/station/compound

5.13 Spoil heap or slimes dam^A

5.14 Quarry, sand or borrow pit

5.15 Dam or reservoir

5.16 Hospital/medical centre

5.17 School

5.18 Tertiary education facility

5.19 Church

5.20 Old age home

5.21 Sewage treatment plant^A

5.22 Train station or shunting yard^N

5.23 Railway line^N

5.24 Major road (4 lanes or more)^N

5.25 Airport^N

5.26 Harbour

5.27 Sport facilities

5.28 Golf course

5.29 Polo fields

5.30 Filling station^H

5.31 Landfill or waste treatment site

5.32 Plantation

5.33 Agriculture ✓

5.34 River, stream or wetland

5.35 Nature conservation area

5.36 Mountain, koppie or ridge

5.37 Museum

5.38 Historical building

5.39 Protected Area

5.40 Graveyard

5.41 Archaeological site (some archaeological artefacts were found on site, see Appendix D) ✓

5.42 Other land uses (describe) ✓

Grazing

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	YES	NO ✓
Archaeological or palaeontological sites, on or close (within 20m) to the site?	No ✓	
If YES, explain:		
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site. Please see the Heritage Report attached in Appendix D.		

<p>Briefly explain the findings of the specialist:</p>	<p>Certain sensitive areas were identified by the archaeological and heritage study undertaken for the 150MW (see Appendix D). These sensitive areas included:</p> <ul style="list-style-type: none"> • Historic stone kraals and small stone circles were found in association with the southern koppies. One stone circle was associated with fine line rock engravings and historical graffiti. The other stone circle comprised two small, C-shaped circles, possibly representing hunting blinds. • Additional fine line engraved rocks and pecked rocks were also found on the northern koppie. • Middle Stone Age artefacts were found near and in association with the koppies <p>No stone artefacts, engraved rocks or kraals were found on the level areas which have been identified for the solar facility All of these sensitive areas have been avoided by the proposed project development.</p>	
<p>Will any building or structure older than 60 years be affected in any way?</p>	<p>YES</p>	<p>NO✓</p>
<p>Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?</p>	<p>YES</p>	<p>NO✓</p>
<p>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.</p>		

SECTION C: PUBLIC PARTICIPATION

See Public Participation documentation in Appendix G. Public Participation Activities to date includes:

- Site notice placement in English and Afrikaans.
- Newspaper placement in English and Afrikaans in the Express Newspaper (community newspaper) and the Volksblad (the regional paper) to advertise initial notification.
- Background Information Documents (BIDs) were distributed to neighboring landowners and at local shops and municipalities.
- Newspaper placement in Afrikaans in the Express Newspaper and the Volksblad to advertise Draft BAR availability as well as Focus Group Meetings.
- Notification of Draft BAR availability as well as Focus Group Meetings were sent out to stakeholders.
- A Focus Group meeting was held at the Koffiefontein Community Hall on the 11 April 2012.

Please see Appendix G for proof of site notices, newspaper placement, BID distribution and the Focus Group meeting attendance register.

1. ADVERTISEMENT

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

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
 - (i) the site where the activity to which the application relates is or is to be undertaken; and
 - (ii) any alternative site mentioned in the application;
- (b) giving written notice to—
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vii) any other party as required by the competent authority;
- (c) placing an advertisement in—
 - (i) one local newspaper; or
 - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy;
 - (ii) disability; or
 - (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
 - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
 - (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
 - (iii) the nature and location of the activity to which the application relates;
 - (iv) where further information on the application or activity can be obtained; and
 - (iv) the manner in which and the person to whom representations in respect of the application may be made.

The contents of the notices and adverts were in accordance with the requirements above (see Appendix G).

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 advertisement was placed in a local newspaper, Express Newspaper as well as the regional paper, the Volksblad to ensure potential I&APs in the area are reached. Adverts were placed in the initial notification phase as well during the Draft BAR release. Site notices were placed at the entrance to the site. See Appendix G.

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.

Given the limited size and remote location of the proposed development, the level of public participation undertaken thus far and to be undertaken is considered appropriate and adequate. Focus group meetings will be held during the public comment period.

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.

6. AUTHORITY PARTICIPATION

Initial notifications were sent to the relevant authorities, although no comments from the authorities have been received to date. The list of all authorities that have been notified can be found in Appendix G as well as proof of this notification.

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.

List of authorities informed:

Initial notifications were sent and comment on the BAR was requested from the following authorities:

**South African Heritage Resources Agency (SAHRA) Head Office Cape Town
Department of Water Affairs (DWA)
Department of Energy
National Energy Regulator of South Africa (NERSA)
Free State Department of Economic Development, Tourism & Environmental Affairs (DETEA)
Letsemeng Local Municipality
Free State Department of Agriculture and Rural Development
Xhariep District Municipality**

Proof of this correspondence can be found in Appendix G

List of authorities from whom comments have been received:

Free State Department of Economic Development, Tourism & Environmental Affairs (DETEA)

Request for comment will be followed up with the list of authorities informed.

7. CONSULTATION WITH OTHER STAKEHOLDERS

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

YES	NO ✓
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Has any comment been received from stakeholders?

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

The Draft BAR was made available to stakeholders (see Appendix G for proof of notification). No comment has been received to date but stakeholders will be notified that the Final BAR has been submitted to the DEA and will be afforded 21 days in which to comment on the Final BAR. Any comments received will be forwarded to the DEA.

The I&AP list is included in Appendix E and includes surrounding landowners, environmental and conservation agencies, parastatals, non-governmental organizations, members of the community and general public.

A Focus Group meeting was held on the 11 April 2012 at the Koffiefontein Community Hall.

SECTION D: IMPACT ASSESSMENT

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

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

Free State Department of Economic Development, Tourism & Environmental Affairs (DETEA): 14 April 2012:

- Satisfied with the measures proposed in the Environmental Management Programme, Heritage Impact Assessment Report and Draft Basic Assessment Report.
- Possible visual impact of the solar panels on driver visibility from the R705.

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):

- Your recognition of the mitigation measures stipulated is noted.
- Possible visual impact on driver visibility from the R705 has been noted. This impact has been considered in the alternative consideration i.e.
- *Alternative S1: Site Layout A (most preferred layout) is located to the north of the main koppie on site, therefore this alternative will cause the least visual impact as the koppie provides a visual screening from the R705.*
- *Alternative S2: Site Layout B (less preferred layout) is located to the south of the main koppie on site. This alternative is not preferred as it more visible from the R705 than Alternative S1.*
- *Alternative S3: Site Layout C is located next to the R705 and to the south of the main koppie on site. This site alternative will cause the greatest visual impact due to its close proximity to the R705.*

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

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

Methodology used for Assessing Impacts

The assessment methodology employed for this project was developed by Environmental Resources Management (ERM) and is in line with Department of Environmental Affairs (DEA) requirements.

The impact assessment for the proposed project commenced with a site investigation. The site investigation was carried out by ERM in order to better understand the site setting and the affected biophysical and social context and identify any sensitive receptors. During the site investigation key personal that would be involved in the proposed installation were interviewed.

The adequate assessment and evaluation of the potential impacts and benefits that will be associated with the proposed project necessitates the development of a scientific methodology that will reduce the subjectivity involved in making such evaluations. A clearly defined methodology was used in order to accurately determine the significance of the predicted impacts on, or benefit to, the surrounding natural and/or social environment. The proposed project was considered in the context of the area.

Mitigation was incorporated into the project design in order to avoid or reduce negative impacts and enhance positive impacts. For the identified significant impacts in the construction and operational phases, the project team worked with the client in identifying suitable and practical mitigation measures. A description of these mitigation measures is included within the Environmental Management Programme (EMPr) (Appendix F).

Determination of impact significance

The significance of potential impacts can be described in terms of the impact's importance. Importance relates to one or multiple factors such as:

- Potential cumulative effects;
- The extent, duration, nature, intensity and likelihood of occurrence;
- The effect of the impact in terms of the degree of change to the biophysical and socio-economic environment;
- The sensitivity of the receiving environment; and
- An indication of whether the impact meets legal or policy requirements.

Based on the above criteria, one can synthesize the ratings given to determine the overall significance of the impact. For the purposes of this assessment, the impact significance is rated post- mitigation.

The following are descriptions of the overall post-mitigation significance ratings:

Negligible: Insignificant or no residual impacts.

Minor: An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small and well within accepted standards, and/or the receptor is of low sensitivity/value.

Moderate: An impact of moderate significance is one within accepted limits and standards. The emphasis for moderate impacts is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that "moderate" impacts have to be reduced to "minor" impacts, but that medium impacts are being

managed effectively and efficiently.

Major: An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors.

Underlying assumptions

The conclusions presented in this BAR assumes the following:

- Site conditions as experienced and documented during the site visit are representatives of general and average conditions.

Uncertainties

- An impact assessment will always contain a degree of subjectivity, as it is based on the value judgment of specialists and the EIA practitioner. The evaluation of significance is thus contingent upon values, professional judgement, and dependent upon the environmental and community context.
- ERM relied on Solar Reserve to provide correct and up to date information. This assessment has been based on project description information provided to ERM by Solar Reserve e.g. volumes of water required.
- The descriptions provided for the biophysical and socio-economic receiving environment relied heavily on existing secondary data.

2.1 IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

No impacts are anticipated to result from the planning and design phase of the proposed PV power facility.

2.2 IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

The assessment to follow, for each of the impacts, is applicable to both site alternatives as the bulk of the impacts are similar however, differences are highlighted below.

Direct impacts

Noise:

During the construction phase, vehicles including delivery trucks, generators, concrete mixing, steel works and minimal excavation equipment will produce a noise disturbance. Road construction and the construction of the onsite buildings will produce a noise disturbance. Delivery vehicles will create some noise and vibration along access routes. Noise emitted during construction activities will increase the ambient noise levels at the site since current

noise levels are estimated to be low at 35 - 40 dBA. Increased noise during the construction phase would be short-lived for specific work areas since the construction work would be progressive across the site.

Impacts of both alternatives are the same.

Mitigation:

- Equipment will be fitted with silencers where possible.
- Mechanical equipment with lower sound power levels would be selected to ensure that the permissible occupation noise-rating limit of 85 dBA is not exceeded. Construction workers and personnel would wear hearing protection when required.
- Vehicles and machines will be properly serviced and well maintained.
- Vehicles must adhere to speed limits, and not exceed 40km/h.
- A Grievance Procedure (included in EMPr) will be established whereby noise complaints by neighbours are recorded and responded to.

Dust: Limited dust generation may occur during vegetation clearance, transportation of materials for construction, cable trenching and the construction of buildings. Dust will be a temporary impact associated with the construction phase of the project. Taking into consideration the distance of sensitive receptors to the site, impacts from increased dust are not likely to be significant.

Impacts of both alternatives are the same.

Mitigation:

- Dust control methods such as wetting the surface should be implemented.
- Vehicles travelling on unpaved or gravel roads must not exceed a speed of 40 km/hr.
- Stockpiles of dusty materials must be enclosed or covered by suitable shade cloth or netting to prevent escape of dust during loading and transfer from site.
- All directly affected and neighbouring farmers must be able to lodge grievances with Solar Reserve using the Grievance Procedure (included in the EMPr) regarding dust emissions that could be linked to the project.

Destruction and Loss of Grazing Capacity and Agricultural Potential:

The area comprises mainly red, freely drained, structureless soils of the Hutton form, mainly deep in the north and shallower in the south. Along with the red soils, a smaller area of rock with shallow soils occurs in the south-east, with deeper, alluvial soils close to the river. The dominant soil potential is high in the north, and low in the south, but the low rainfall in the area means that the only means of cultivation would be by irrigation. There are significant areas of irrigation evident close to the Riet River, but no cultivation evident near the road or further north.

The climatic restrictions mean that this part of the Free State is suited at best for grazing and here the grazing capacity is low, around 14-17 ha/large stock unit.

The major impact on the natural resources of the study area would be the loss of potentially arable land due to the construction of the various types of infrastructure, such as solar panels, connecting cables, access roads, substation etc. However, due to the relatively dry and hot climate of the region, this impact would in all probability be of limited significance and would be local in extent. At the end of the project life, it is anticipated that removal of the structures would enable the land to be returned to more or less a natural state following rehabilitation, with little impact, especially given the low prevailing agricultural potential.

Mitigation:

- Ensure that as little pollution or other non-physical disturbance occurs, and that the deeper, productive irrigated areas near the river are not affected (either directly or indirectly) in any way.
- Damage to farmland caused by construction activities will be minimized by ensuring strict compliance with construction plans by minimizing the development footprint and to implement a 'Code of Conduct' governing workers.
- The design of the infrastructure layout will be in a manner that limits the footprint of the facility and all associated infrastructure.
- Any damage to vegetation outside the design of the project footprint will be rehabilitated in accordance with mitigation proposed for the rehabilitation of vegetation in the EMPr.
- Vehicles will only drive on demarcated roads.

Waste:

The construction of the PV power facility will produce a variety of waste products. The main sources of waste will result from the temporary construction camp and construction activities. One of the main sources of non-hazardous wastes will be the domestic type solid waste from the temporary construction camp. These wastes will be produced daily and comprise of the following:

- Domestic type waste, such as mixed waste from kitchens/canteen or living quarters;
- residual packaging and food wastes
- metal cans (from food and drinks)
- plastics drinks bottles
- glass jars and bottles
- Wooden pallets and cartons;
- Scrap metal;
- Concrete waste;
- Paper and cardboard;
- Grey water - from showers; and
- Food wastes.

The initial solid waste generated on site will also be the cleared vegetation and soil overburden.

The construction phase will require the use of hazardous materials such as fuels and greases to fuel equipment and vehicles and maintain equipment. These substances will be stored on site in temporary aboveground storage tanks.

Mitigation:

- All wastes produced from project activities on site will be transferred to designated temporary storage areas and where possible into secure containers.
 - Solid wastes will be segregated to facilitate reuse and recycling of specific materials.
 - All wastes that cannot be reused or recycled will be collected by approved waste contractors and transferred to an appropriately licensed waste management facility for treatment and disposal.
- All project generated wastes will need to be managed and disposed of in a manner to prevent potential impacts on the environment and risks to human health. A Waste Management Plan (WMP) for the proposed project will be developed. This will follow the principles of waste minimisation at source, segregation for reuse, recycling, treatment or disposal.
- It is recommended that all concrete mixing be undertaken on impermeable plastic lining to prevent contamination of the soils and surrounding areas.
 - Construction solid waste will be managed via a Construction Environmental Management Plan

(EMP) and will incorporate reduction, recycling and re-use principles.

- The contractor will remove refuse collected from the working areas at the site at least once a week.
- All builders' rubble generated during the construction phase shall be removed from the site at least once a week to a licensed landfill site.
- Fuels on site will be stored in a locked container within a fenced and secure temporary staging area.
- Trucks and construction vehicles will be serviced off site.
- The use, storage, transport and disposal of hazardous materials used for the project will be carried out in accordance with all applicable South African regulations.
- Material Safety Data Sheets for all applicable materials present on site will be readily available to on site personnel.

Soil Degradation and Erosion:

There will be an increased erosion risk on the site as a result of soil disturbance and loss of vegetation cover. Soil erosion can have impacts that extend beyond the site as increased sediment transport into drainage channels can result in drainage channel siltation and the loss of wetland habitat and ecosystem function. Soil may also be impacted as a result of spills or leaks of fuels, oils and lubricants from construction vehicles or storage tanks. The likelihood of a spill is associated with the volume of product that may be stored on site. Usually, above ground storage tanks for diesel and varying amounts of hydraulic oils will be required onsite during the construction phase.

Impacts of both alternatives are the same.

Mitigation:

- Wherever possible, roads and tracks should be constructed so as to run along the contour.
- All roads and tracks running down the slope must have water diversion structures present.
- Any extensive cleared areas that are no longer or not required for construction activities should be re-seeded with locally-sourced seed of suitable species. Bare areas can also be packed with brush removed from other parts of the site, encourage natural vegetation regeneration and limit erosion.
- No construction vehicles should be allowed to drive around the veld (open site area). All construction vehicles should remain on properly demarcated roads.
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site.
- The storage area needs to be bunded with a capacity of 110% of the tank volume; tanks and associated infrastructure need to be inspected regularly.
- 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.

Impacts on Surface Water and Groundwater:

Surface water and groundwater may be impacted as a result of infiltration of contaminants associated with spills or leaks of fuels, oils and lubricants from construction vehicles or storage tanks. These impacts are dependent on the vulnerability and susceptibility of the aquifer. The likelihood of a spill is also associated with the volume of product that may be stored onsite. Usually, above ground storage tanks for diesel and varying amounts of hydraulic oils, transformer oil and used oils will be required onsite during the construction phase.

Impacts of both alternatives are the same.

Mitigation:

- 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.
- . -Vehicles will be serviced and maintained off site.

Loss and Disturbance of Sensitive Plant Communities:

The construction phase will require the clearing of vegetation (Devil's Claw *Harpagophytum procumbens*) in areas which were observed to contain plant species protected under NEMA therefore no individuals may be destroyed, picked harvested etc without a permit. Additionally, due to the high medicinal properties of the species, there is a high risk of widespread poaching during the construction phase. The local populations of these species will be impacted unless mitigation measures are implemented.

Alternative S1: Site Layout A will cause the least impact to very high ecological sensitive areas and high sensitive areas on site.

Alternative S2: The construction of the PV power facility will impact on sensitive ecological areas as very high and high ecological areas are located within Site Layout B.

Alternative S3: Site Layout C has the highest amount of ecological sensitive areas and construction within this area will cause the highest impact on these sensitive areas compared to Alternative S1 and Alternative S2,

Mitigation

- Vegetation clearing to be kept to a minimum
- All areas to be cleared should be clearly demarcated.
- Sensitive areas as demarcated on the sensitivity map should be avoided, and where such areas occur within or near the development area, they should be clearly demarcated as no-go areas.

Loss and disturbance of natural vegetation and Increased Alien Plant Invasion:

Loss and disturbance of natural vegetation due to roads and PV array construction activities. Apart from the loss of plant cover in cleared areas, the disturbance would also encourage the invasion of alien plant species, a number of which were observed at the site.

Mitigation:

- Vegetation clearing to be kept to a minimum
- All areas to be cleared should be clearly demarcated.
- Sensitive areas as demarcated on the sensitivity map should be avoided, and where such areas occur within or near the development area, they should be clearly demarcated as no-go areas.

Faunal Habitat Loss and Disturbance:

Impacts on the local faunal communities would occur as a result of habitat destruction, alteration and disturbance. The site contains several burrow systems that could potentially be impacted, leading to direct mortality as well as habitat loss if these are bulldozed. Amphibians are particularly susceptible to pollutants which may result from fuel and chemical spills during construction, while shy mammals would move away from the area particularly during the construction phase as a result of the noise and human activities present. Some mammals and reptiles such as tortoises would be vulnerable to illegal collection or poaching during the construction phase as a result of the large number of construction personnel that are likely to be present.

Mitigation:

- Any fauna directly threatened by the construction activities should be removed to a safe location by the Environmental Control Officer (ECO). This must be supervised by an appropriately qualified ecological specialist.
- The collection, hunting or harvesting of any plants or animals at the site should be strictly

forbidden. Any personnel found collecting, hunting or harvesting of any plants or animals will be removed from the project permanently and removed from the site immediately.

-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.

-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.

Loss of Landscape Connectivity:

Disruption of landscape connectivity for fauna could result if the site is fenced off in a manner which prevents the movement of larger and middle-sized mammals. Furthermore, since most such mammals have home ranges which exceed the extent of the site, any mammals trapped within the site would probably not have sufficient resources present to be able to support themselves.

Mitigation:

-Fencing should be constructed in manner which allows for the passage of small and medium sized mammals. Steel palisade fencing (20 cm gaps min) is a good option in this regard as it allows most medium-sized mammals to pass between the bars, but remains an effective obstacle for humans. Alternatively the lowest strand or bottom of the fence should be elevated to 15 cm above the ground at least at strategic places to allow for fauna to pass under the fence.

-If electrified strands are to be used, there should be no strands within 30 cm of the ground because tortoises retreat into their shells when electrocuted and eventually succumb from repeated shocks.

Employment Creation:

PV power facilities create the largest employment opportunities per MW of electricity generated in comparison to other renewable power generation technologies. It is estimated that 40-60 workers will be required during construction of the PV power facility. The skill sets learned will be valuable and transferable to other projects elsewhere in the Free State.

Mitigation:

-The labour contract between Solar Reserve and Subcontractors who are appointed to provide services during the construction phase of the development will specify local labour employment criteria, e.g. percentage of total workforce.

-Solar Reserve will develop a Procurement and Recruitment Policy which sets reasonable targets for the employment of South African and local residents /suppliers (originating from the local municipality) and promote the employment of women as a means of ensuring that gender equality is attained. Criteria must be set for prioritizing, where possible, local (local municipal) residents/suppliers over regional or national people/suppliers.

-Initial recruitment and training for local personnel will take place prior to and during the construction phase.

-No employment will take place at the entrance to the site. Only formal channels for employment will be used.

Visual Impact

During the construction phase there will be a visual impact caused by the presence of construction vehicles, machinery and equipment.

Impacts are the same for both alternatives.

Alternative S1: Site Layout A is located to the north of the main koppie on site, therefore this

alternative will cause the least visual impact as the koppie provides a visual screening from the R705.

Alternative S2: Site Layout B is located to the south of the main koppie on site. This alternative is not preferred as it more visible from the R705 than Alternative S1.

Alternative S3: Site Layout C is located next to the R705 and to the south of the main koppie on site. This site alternative will cause the greatest visual impact due to its close proximity to the R705.

Mitigation:

- Avoid development of solar energy facilities or related infrastructure to the south of the main koppie on the site, and on the slopes of the koppie.
- Maintain visual buffers of at least 30m to 50m from the external farm boundaries.
- Avoid drainage courses as determined by the hydrologist, as these are also natural features in the landscape.
- Locate all cables and power lines underground as far as possible.
- Cluster the substation, maintenance and storage buildings together if possible, and locate these close to the existing power lines. Buildings should be located in low-lying areas and not on hillslopes or high ground.
- The design of the buildings should be compatible in scale and form with rural buildings of the surrounding area. All yards and storage areas should be enclosed by masonry walls.
- The construction camp, material stores and lay-down area should be screened from the 705 district road and preferably located in the vicinity of the proposed maintenance buildings to minimise disturbance.
- The extent of the construction camp and stores should be limited in area to only that which is essential.
- Disturbed areas rather than pristine or intact landscape areas should preferably be used for the construction camp.
- Borrow pits for the construction are assumed to be from local approved sites. New borrow pits would be subject to permits from the relevant authorities, and should preferably not be visible from the 705 Route.

Traffic:

There will be an increase in traffic during the construction phase due to an increased number of trucks delivering construction material and equipment (PV panels, frames etc) to the site. Infrastructure required for the proposed PV power facility, including support structures, PV modules, frames, as well as machinery will be transported to and from the site from various locations in the region.

Mitigation:

Impacts associated with the higher traffic volumes can be accommodated by proper site management, by controlling the size of orders that would be transported to the site at any given time and by notifying the public through local and regional media centres when large freight-carrying vehicles will be on the roads.

Palaeontology, Archaeology and Cultural Heritage

The Ruimte Solar farm will affect areas on Wagenmaker's Drift 24 that contain Ecca and Quaternary (aeolian sand) deposits. The areas on the farm that contain Jurassic dolerite (which are also non-fossiliferous) and Quaternary calcrete, do not fall within the proposed development site. Wagenmaker's Drift 24 does have the potential to contain fossils as the south-western portion of the farm, which borders the Riet River, is known to contain Quaternary fossils in its banks. However, the proposed development is positioned well away from the river or any tributaries (dry river beds with potentially fossiliferous exposures) and thus, the impact on

palaeontological material is negligible (rated Low or negative).

The MSA stone artefact scatters are found across the Karoo. They contain no diagnostic elements which would contribute to current studies on the MSA. They are considered to have low significance.

The engraved dolerite boulders with fineline engravings and pecking are of interest although they too, are widespread across the interior of the country. Nevertheless, this observation adds to our knowledge of the distribution of fineline rock engravings. They contribute to the range of variability observed with respect to designs. They are considered to have moderate to high significance.

The rectangular stone kraals are believed to belong to the historic period (i.e. to the period after 1862 when the farm was first settled), while circular kraals may be older and may have been constructed in the pre-colonial period by Khoisan herders. However, these roughly packed circular stone structures are not associated with LSA stone artefacts or pottery, and their affiliation is therefore unclear. They are considered to have low significance.

The water reservoir, which falls on the border of the edge of the area proposed for the construction of the PV panels, may be older than 60 years, although this may be difficult to determine. It has low significance.

The cultural landscape is generally of low cultural significance.

Alternative S1: As Site Layout A is located north of the main koppie on site, the impact on the cultural landscape will be minimized.

Alternative S2: Site Layout B is located south of the main koppie on site and as it is more visible from the R705, it affects the cultural landscape of the area.

Alternative S3: Site Layout C is situated adjacent to the R705 and is highly visible from R705 users and would have the greatest effect on the cultural landscape of the area.

Mitigation:

-No palaeontological mitigation is required as the proposed development is positioned well away from the Riet River or any tributaries and thus, the impact on palaeontological material is negligible (rated Low or negative);

-However, the ECO responsible for the development must remain aware that all sedimentary deposits have the potential to contain fossils and he/she should thus monitor all substantial excavations into sedimentary bedrock for fossil remains. If any fossils are found during construction, SAHRA should be notified immediately;

-With regard archaeological resources, it is recommended that no construction should be allowed on the koppies to the north or south of the proposed facility. This includes access roads, underground cabling or powerlines. This will ensure that the rock engravings which are found on the dolerite boulders on top of the hills, as well as stone kraals abutting the hills, are not destroyed;

-No mitigation measures are recommended with regard the Built Environment;

-If any human remains are uncovered during the construction of the site, work should stop in that area, and the SAHRA Burials Unit should be notified. They will investigate and propose a way forward;

-It is recommended that the facility is constructed to the north of the southern koppies to ensure that it is not visible from the R705. It is anticipated that the visual impact of the facility on the Cultural Landscape of the area will be low, but this will need to be verified by the visual

specialist.

Increased Social Ills Linked to Influx of Job Seekers

The introduction of construction activity in remote, rural environment may bring about social change due to an influx of workers and job-seekers into the area. The most likely social ill that may occur as a result of the increased number of workers and job-seekers are described below.

- Theft of livestock, which is often problematic on farms located close to towns, roads and in areas where construction work is taking place. It is likely that stock theft will continue and possibly increase during the construction phase.
- Petty crimes (e.g. theft of tools, household items and farm materials) on the project affected farm and neighbouring farms could occur.

Given the relatively small numbers of workers and job-seekers, it is likely that this impact will be relatively limited. In addition, many of the workers are likely to be local residents and as such already part of the community social structures and family networks.

Impacts are the same for both alternatives.

Mitigation:

Solar Reserve must develop a Code of Conduct that must be adhered to by contractors, it must address the following aspects: respect for local residents; respect for farm infrastructure and agricultural activities; no hunting or unauthorised taking of products or livestock; zero tolerance of illegal activities by construction personnel.

- Solar Reserve will implement a grievance procedure that is easily accessible to local communities, through which complaints related to contractor or employee behaviour can be lodged and responded to.

Indirect impacts

Local Economy Benefits

The project will lead to increased spending in the local economy via employment (increase in wages), and procurement of goods and services. This in turn will create further indirect spending and thus the generation of indirect and induced job opportunities.

Impacts are the same for both alternatives.

Mitigation

-The labour contract between Solar Reserve and Subcontractors who are appointed to provide services during the construction phase of the development will specify local labour employment criteria, e.g. percentage of total workforce.

-Solar Reserve will develop a Procurement and Recruitment Policy which sets reasonable targets for the employment of South African and local residents /suppliers (originating from the local municipality) and promote the employment of women as a means of ensuring that gender equality is attained. Criteria must be set for prioritising, where possible, local (local municipal) residents/suppliers over regional or national people/suppliers.

-Initial recruitment and training for local personnel will take place prior to and during the construction phase.

-No employment will take place at the entrance to the site. Only formal channels for employment will be used.

Unmet Stakeholder Expectations

The development may create false expectations around high levels of employment opportunities. This may lead to an influx of workers into the area due to perceived employment opportunities.

Impacts are the same for both alternatives.

Mitigation:

-Solar Reserve will undertake clear communication with all stakeholders regarding realistic employment opportunities .

Cumulative impacts

Visual and Landscape Impacts:

There are a number of known proposed solar energy facilities planned in the Free State in close proximity to the proposed solar facility, including the following:

- Graspan 90MW (55km from Ruimte)
- Wag'nbiekiespan (65km from Ruimte)

These PV Power facilities will impact on the rural feel of the area.

Mitigation

A strategic environmental perspective needs to be taken by the Department of Environmental Affairs in granting environmental authorization to applicants.

2.3 IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

Alternative (preferred alternative and alternative) The assessment to follow, for each of the impacts, is applicable to both site alternatives as the bulk of the impacts are similar however, differences are highlighted below.

Direct impacts

Noise

The increased activity on the farm by maintenance staff, and increased traffic will create an increase in the ambient noise level at the site.

Impacts are the same for both alternatives.

Mitigation:

No additional mitigation measures apart from the mitigation measures for the construction phase have been suggested as there are no sensitive receptors close to the site.

Waste

Operations and maintenance of the PV power facility is expected to generate minimal general waste.

Impacts are the same for both alternatives.

Mitigation:

- Designated waste bins will be provided and regularly taken to the municipal waste stream.
- Separate bins will be provided for recycling material and general waste.

Soil Degradation and Erosion:

There will be an increased erosion risk on the site as a result of soil disturbance and loss of vegetation cover. Soil erosion can have impacts that extend beyond the site as increased sediment transport into drainage channels can result in drainage channel siltation and the loss of wetland habitat and ecosystem function. Soil may also be impacted as a result of spills or

leaks of fuels, oils and lubricants from construction vehicles or storage tanks. The likelihood of a spill is associated with the volume of product that may be stored on site. Usually, above ground storage tanks for diesel and varying amounts of hydraulic oils will be required onsite during the construction phase.

Impacts are the same for both alternatives.

Mitigation:

-All hazardous materials will be stored in the appropriate manner to prevent contamination of the site.

-The storage area needs to be bunded with a capacity of 110% of the tank volume; tanks and associated infrastructure need to be inspected regularly.

-Any accidental chemical, fuel and oil spills that occur at the site will be cleaned up in the appropriate manner as related to the nature of the spill.

-Regular monitoring will be undertaken for erosion to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. All erosion problems observed will be rectified as soon as possible.

-All maintenance vehicles to remain on the demarcated roads.

Loss and Disturbance of Sensitive Plant Communities:

There will be a loss of plant cover as a result of vegetation clearing for roads, PV panel support structures and the other infrastructure of the development. This may impact sensitive plant communities, endangered or protected plant species or result in habitat loss for sensitive fauna.

Mitigation:

-All maintenance crew to be aware that no plants or animals may be interfered with.

-No unauthorised personnel to be allowed onto the site.

Loss and Disturbance of natural vegetation and Increased Alien Plant Invasion:

Increased risk of alien plant invasion resulting from the high levels of disturbance during construction as well as potentially from maintenance activities during the construction phase.

Mitigation:

-All alien plants present at the site should be controlled annually using the best practice methods for the species present.

- Regular monitoring to ensure that alien plants are not increasing as a result of all the disturbance that has taken place.

Faunal Habitat Loss and Disturbance:

-Impacts on the local faunal communities would occur as a result of habitat destruction, alteration and disturbance. The site contains several burrow systems that could potentially be impacted, leading to direct mortality as well as habitat loss if these are bulldozed. Amphibians are particularly susceptible to pollutants which may result from fuel and chemical spills during construction, while shy mammals would move away from the area particularly during the construction phase as a result of the noise and human activities present. Some mammals and reptiles such as tortoises would be vulnerable to illegal collection or poaching during the construction phase as a result of the large number of construction personnel that are likely to be present.

Impacts are the same for both alternatives.

Mitigation:

-No unauthorized persons should be allowed onto the site.

-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.

- The collection, hunting or harvesting of any plants or animals at the site will be strictly forbidden. Any personnel found collecting, hunting or harvesting of any plants or animals will be removed from the project permanently and removed from the site immediately.
- Fires will only be allowed within fire-safe demarcated areas.
- No fuelwood collection will be allowed on-site.
- No dogs will be allowed on site.
- All hazardous materials will be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site will be cleaned up in the appropriate manner as related to the nature of the spill.

Loss of Landscape Connectivity:

Loss of connectivity of the landscape for fauna resulting from vegetation clearing as well as security fencing. Furthermore, since most such mammals have home ranges which exceed the extent of the site, any mammals trapped within the site would probably not have sufficient resources present to be able to support themselves.

Impacts are the same for both alternatives.

Mitigation:

- Ensure that no larger fauna enter and become trapped within the fenced-off area, either by leaving a gate open so that animals can move freely between the site and the adjacent farm or by keeping all gates closed to ensure that they are excluded.

Employment Opportunities

It is expected that 10-20 jobs will be created during the operational phase of the development..

Mitigation:

- The labour contract between Solar Reserve and Subcontractors who are appointed to provide services will specify local labour employment criteria, e.g. percentage of total workforce. .
- Solar Reserve will develop a Procurement and Recruitment Policy which sets reasonable targets for the employment of South African and local residents /suppliers (originating from the local municipality) and promote the employment of women as a means of ensuring that gender equality is attained. Criteria must be set for prioritizing, where possible, local (local municipal) residents/suppliers over regional or national people/suppliers.

Visual

The proposed energy facilities will be clearly visible from the 705 Route, but surrounding farmsteads and settlements are either too far from the site, or are in a view shadow. Reflections from solar panels are not expected to be an issue at ground level, but may be visible from aircraft. Some lighting related to the solar facility infrastructure could potentially be visible from the 705 Route. Although the viewshed is fairly extensive in the flat and open landscape, much of the surrounding area will be in a view shadow, because of the dolerite koppies. The landscape is not particularly visually sensitive, except for the dolerite koppies and rural ambience. The proposed solar facilities and related infrastructure would contrast with the rural landscape. There are however existing power lines crossing the site. There is little potential for concealment of the proposed solar facilities, except through mitigation planting and berms along the 705 Route.

Site Alternative 1: Site Layout A is located within the views shadow and will be the least visible during the operational phase.

Site Alternative 2: Site Layout B would be visible from the R705 during operation.

Site Alternative 3: Site Layout C would be visible from the R705 during operation.

Mitigation:

- Avoid development of solar energy facilities or related infrastructure to the south of the main koppie on the site, and on the slopes of the koppie.
- Maintain visual buffers of at least 30 to 50m from the external farm boundaries.
- Avoid drainage courses as determined by the hydrologist, as these are also natural features in the landscape.
- Locate all cables and power lines underground as far as possible.
- Cluster the substation, maintenance and storage buildings together if possible, and locate these close to the existing power lines. Buildings should be located in low-lying areas and not on hillslopes or high ground.
- The design of the buildings should be compatible in scale and form with rural buildings of the surrounding area. All yards and storage areas should be enclosed by masonry walls.
- The construction camp, material stores and lay-down area should be screened from the 705 district road and preferably located in the vicinity of the proposed maintenance buildings to minimise disturbance.
- The extent of the construction camp and stores should be limited in area to only that which is essential.
- Disturbed areas rather than pristine or intact landscape areas should preferably be used for the construction camp.
- Borrow pits for the construction are assumed to be from local approved sites. New borrow pits would be subject to permits from the relevant authorities, and should preferably not be visible from the 705 Route.

Destruction and Loss of Grazing Capacity and Agricultural Potential

The presence of the PV power facility will result in a reduction in the area of land that is available for agricultural use and grazing.

Impacts are the same for both alternatives.

Mitigation:

- Vehicles for maintenance will only drive on demarcated roads.

Impacts on Surface Water and Groundwater:

Although unlikely during the operational phase there is still the potential for surface water and groundwater to be impacted as a result of infiltration of contaminants associated with spills or leaks of fuels, oils and lubricants from maintenance vehicles or storage tanks. These impacts are dependent on the vulnerability and susceptibility of the aquifer. The likelihood of a spill is also associated with the volume of product that may be stored onsite.

Impacts are the same for both alternatives.

Mitigation:

- 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.
- Vehicles will be serviced and maintained off site.
- No chemical additives will be used in undertaking the cleaning of PV panels.

Disturbance to birds: The PV power facility, once constructed, may impact on bird populations in the area to a minor degree by contributing to bird mortality through birds colliding with power lines or associated pylons. In addition certain bird species may be attracted to the PV arrays, using the erected structures as prominent perches, sheltered roost sites or even nesting sites, and possibly foraging around the infrastructure in response to changes in the distribution of preferred foods.

Mitigation:

- Attaching spikes and other deterrents to specific positions on the structures, to prevent birds from perching in areas with an electrocution risk.
- Bird flappers to be used on the powerline.

Socio-economic opportunities

It is expected that 10-20 jobs will be created during the operational phase of the development and 20 percent of that labour force would need to be skilled.

Mitigation: Solar Reserve will develop a procurement and recruitment policy

Indirect Impacts**Local Economy Benefits:**

The project will lead to increased spending in the local economy via employment (increase in wages), and procurement of goods and services. This in turn will create further indirect spending and thus the generation of indirect and induced job opportunities.

Impacts are the same for both alternatives.

Mitigation

- The labour contract between Solar Reserve and Subcontractors who are appointed to provide services will specify local labour employment criteria, e.g. percentage of total workforce.
- On-going reporting regarding employment specifics to the PSC is required.
- Solar Reserve will develop a Procurement and Recruitment Policy which sets reasonable targets for the employment of South African and local residents /suppliers (originating from the local municipality) and promote the employment of women as a means of ensuring that gender equality is attained. Criteria must be set for prioritising, where possible, local (local municipal) residents/suppliers over regional or national people/suppliers.
- Initial recruitment and training for local personnel will take place prior to and during the construction phase.

Cumulative impacts**Visual and Landscape Impacts:**

There are a number of known proposed solar energy facilities planned in the Free State, including the following:

- Graspan 90MW (55km from Ruimte)
- Wag'nbiekiespan (65km from Ruimte)

This list will be updated throughout the BAR process.

These PV Power facilities will impact on the rural feel of the area.

Mitigation

A strategic environmental perspective needs to be taken by the Department of Environmental Affairs in granting environmental authorization to applicants.

2.4 IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASES

Alternative (preferred alternative and alternative) The assessment to follow, for each of the impacts, is applicable to both site alternatives as the bulk of the impacts are similar however, differences are highlighted below.

Direct impacts

Noise

During the decommissioning phase, vehicles will be required to load and remove equipment including panels which may produce an increase in noise disturbance. Additionally the physical removal of the PV array structures will cause an increase in the noise level. Impacts are likely to be the same as the construction phase.

Impacts are the same for both alternatives.

Mitigation:

The same mitigation measures as stipulated for the construction phase will apply.

Dust

Limited dust generation may occur, although vegetation clearance would not be required during decommissioning, increased vehicle activity on and around the site during decommissioning would result in a temporary dust impact. Taking into consideration the distance of sensitive receptors to the site, impacts from increased dust are not likely to be significant.

Impacts are the same for both alternatives.

Mitigation:

The same mitigation measures as the construction phase will apply.

Waste

It is expected that the decommissioning of the PV power facility will result in the production of the same quantity and type of wastes as the construction phase. Once PV panels are decommissioned, the majority of components will be recycled (including the PV panels, structures, and electrical equipments) or transported with trucks to the nearest licensed disposal facility.

Impacts are the same for both alternatives.

Mitigation:

- All of the mitigation measures as stipulated for the construction phase will apply.
- All wastes and PV power facility components that can be recycled will be recycled.

Soil Degradation and Erosion:

During the decommissioning of the PV power facility there is still the potential for soil degradation and erosion. Although stabilising vegetation would have grown between and underneath the PV arrays, some vegetation may be required to be cleared in order to remove the PV array structures. Soil may also be impacted as a result of spills or leaks of fuels, oils and lubricants from decommissioning vehicles or storage tanks. The likelihood of a spill is associated with the volume of product that may be stored on site. Usually, above ground storage tanks for diesel and varying amounts of hydraulic oils will be required onsite during the decommissioning phase.

Impacts are the same for both alternatives.

Mitigation:

- Any extensive cleared areas remaining will be re-seeded with locally-sourced seed of suitable species. Bare areas can also be packed with brush removed from other parts of the site, encourage natural vegetation regeneration and limit erosion.
- No decommissioning vehicles will be allowed to drive around the veld (open site area). All

vehicles will remain on properly demarcated roads.

-All hazardous materials will be stored in the appropriate manner to prevent contamination of the site.

-The storage area needs to be bunded with a capacity of 110% of the tank volume; tanks and associated infrastructure need to be inspected regularly.

-Any accidental chemical, fuel and oil spills that occur at the site will be cleaned up in the appropriate manner as related to the nature of the spill.

Impacts on Surface Water and Groundwater:

The same potential impacts on surface water and groundwater exist as during the constructions phase. All of the mitigation measures stipulated for the construction phase will apply during the decommissioning phase.

Impacts are the same for both alternatives.

Loss and Disturbance of Sensitive Plant Communities:

There will be a loss of some plant cover as a result of vegetation clearing for the extraction of the PV array structures.

Mitigation:

-Vegetation clearing to be kept to a minimum.

-All areas to be cleared should be clearly demarcated.

-Sensitive areas as demarcated on the sensitivity map will be avoided and clearly demarcated as no-go areas.

-The entire PV power facility footprint will be rehabilitated to it's original state before the project.

Increased Alien Plant Invasion:

Increased risk of alien plant invasion resulting from disturbance during decommissioning phase.

Impacts are the same for both alternatives.

Mitigation:

-Soil disturbance and vegetation clearing should be kept to a minimum.

-Cleared areas will be revegetated with locally-collected seeds of indigenous species.

Faunal Habitat Loss and Disturbance:

Increased levels of noise, pollution, disturbance and human presence will be detrimental to fauna. Shy mammals would move away from the area as a result of the noise and human activities present. Some mammals and reptiles such as tortoises would be vulnerable to illegal collection or poaching during the decommissioning phase as a result of the large number of construction personnel that are likely to be present.

Impacts are the same for both alternatives.

Mitigation:

-Any fauna directly threatened by the decommissioning activities should be removed to a safe location by the Environmental Control Officer (ECO). This must be supervised by an appropriately qualified ecological specialist.

-The collection, hunting or harvesting of any plants or animals at the site will be strictly forbidden. Any personnel found collecting, hunting or harvesting of any plants or animals will be removed from the project permanently and removed from the site immediately.

-Fires will only be allowed within fire-safe demarcated areas.

-No fuelwood collection will be allowed on-site.

-No dogs will be allowed on site.

-All hazardous materials will be stored in the appropriate manner to prevent contamination of

the site. Any accidental chemical, fuel and oil spills that occur at the site will be cleaned up in the appropriate manner as related to the nature of the spill.

Visual Impact

During the decommissioning phase there will be a visual impact caused by the presence of construction vehicles, machinery and equipment.

Impacts are the same for both alternatives.

Mitigation:

-Any temporary decommissioning camp, material stores and lay-down area should be screened as far as possible from the local roads.

-The extent of the temporary decommissioning camp and stores should be limited in area to only that which is essential.

-Land that has been damaged by the project will be rehabilitated and revegetated.

-Disturbed areas rather than pristine or intact landscape areas should preferably be used for the temporary decommissioning camp.

Traffic

There will be an increase in the volume of traffic around the site due to the number of vehicles required to undertake the decommissioning of the PV power facility. The increased traffic volumes and associated impacts are expected to be the same as that of the construction phase.

All mitigation stipulated in the construction phase will apply.

Impacts are the same for both alternatives.

Palaeontology, Archaeology and Cultural Heritage

During decommissioning activities there is a possibility that archaeological and cultural heritage resources are impacted as the PV power facility is deconstructed and removed.

Impacts are same for both alternatives.

Mitigation:

-No paleontological mitigation is required as the impact on paleontological material is considered negligible (rated Minor or negative).

-The ECO responsible for the development must remain aware that all sedimentary deposits have the potential to contain fossils and he/she should thus monitor all substantial excavations into sedimentary bedrock for fossil remains. If any fossils are found during decommissioning, SAHRA should be notified immediately.

-No mitigation measures are recommended with regard the Built Environment.

-If any human remains are uncovered during the decommissioning of the site, work should stop in that area and the SAHRA Burials Unit should be notified. They will investigate and propose a way forward.

Employment Opportunities:

The decommissioning of the project will lead to a short-term increase in employment as manpower would be required to remove equipment and infrastructure from the site however, the long term effect of closure of the project would be a decrease in employment opportunities in the area. The economic benefits associated with the development will stop after decommissioning of the facility as it will no longer generate electricity or income.

Impacts are the same for both alternatives.

Mitigation

Ensure that the appointed project contractors and suppliers have access to appropriate training (including Health, Safety, Environmental and Quality) as required by the Project. This will help to ensure that they have future opportunities to provide goods and services to the sector.

Loss of Renewable Energy Source

If the PV power facility were to be decommissioned, there would no longer be approximately 18MW of renewable energy available to feed into the national grid.

Indirect impacts

Economic Impact

If the PV power facility were to be decommissioned there would be no more revenue gained from the project to feed into the economy.
Impacts are the same for both alternatives.

Cumulative impacts

If the PV power facility were to be decommissioned, there would be a potential decrease in the visual and landscape cumulative impact in the area as there would be one less PV power facility present.
Impacts are the same for both alternatives.

No-go alternative (compulsory)

The no-go alternative implies that the proposed project would not be executed. Assuming that the solar power facility would not be developed at the proposed site, there would be no increase in electricity generation from the facility, no CO² offsets associated with the proposed development, no economic benefit to the landowners associated with the potential income generated through the operation of the facility and there would be no contribution to meeting South Africa's targets for renewable energy generation. Should the solar farm not be developed the agricultural potential of the site would not be lost due to the establishment of the facility on agricultural land. There would also be no negative environmental and social impacts associated with the development of a solar power facility.

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.

Alternative Comparison

Noise:

- **Extent:** Local, limited to the site and near surroundings
- **Duration:** Intermittent, during construction and decommissioning activities only
- **Likelihood:** High
- **Intensity:** Low, as site is located in a rural setting with few or no receptors considered sensitive within close proximity to the site
- **Mitigation:** Equipment should be fitted with silencers where possible.

- Post-mitigation significance rating: Minor

Post- mitigation significance rating is the same for both alternatives

Dust

- Extent: Local, limited to the site and near surroundings
- Duration: Intermittent, during construction activities
- Likelihood: High
- Intensity: Low, as site is located in a rural setting with few or no receptors considered sensitive within close proximity to the site
- Post-mitigation significance rating: Minor

Post- mitigation significance rating is the same for both alternatives

Waste:

- Extent: Local
- Duration: Short-term, impacts will extend for the duration of the construction phase and decommissioning phase.
- Likelihood: High
- Intensity: Low, as the construction phase is temporary and the number of sensitive receptors is limited. Additionally, waste produced during the decommissioning phase will be recycled as much as possible.
- Post-mitigation significance rating: Minor

Post- mitigation significance rating is the same for both alternatives

Soil Degradation and Erosion

- Extent: Local, limited to the site and near surroundings
- Duration: Long term
- Likelihood: High
- Intensity: Medium (construction phase) and Low (operation phase), as just more than 20ha of vegetation will be cleared for the PV arrays, therefore a small portion of the site will be disturbed which could lead to soil erosion
- Post-mitigation significance rating: Minor

Post- mitigation significance rating is the same for both alternatives

Loss and Disturbance of Sensitive Plant Communities

Alternative S1: Preferred Alternative:

- Extent: Local, limited to the site and near surroundings
- Duration: Short term (construction) and long term (operation)
- Likelihood: High
- Intensity: Medium, as just more than 20ha of vegetation will be cleared for the PV arrays, however, this is a small portion of the actual site
- Post-mitigation significance rating: Moderate (construction) and Minor (operation).

Alternative S2: Less Preferred Alternative

- Extent: Local, limited to the site and near surroundings
- Duration: Long term

- Likelihood: High
- Intensity: Medium-High. The construction of the PV power facility within this area would cause the loss of very high and high ecological sensitive areas.
- Post-mitigation significance rating: Moderate (construction) and Minor (operation).

Alternative S3: Least Preferred Alternative

- Extent: Local, limited to the site and near surroundings
- Duration: Long term
- Likelihood: High
- Intensity: High. The construction of the PV power facility within this area would cause the greatest loss of very high and high ecological sensitive areas.
- Post-mitigation significance rating: Moderate- Major (construction) and Moderate (operation).

Increased Alien Plant Invasion

- Extent: Local, limited to the site and near surroundings
- Duration: Long term
- Likelihood: High
- Intensity: Medium, as just more than 20ha of vegetation will be cleared for the PV arrays, therefore a small portion of the site will be disturbed giving a potential foot-hold for invasive species
- Post-mitigation significance rating: Minor

Post- mitigation significance rating is the same for both alternatives

Faunal Habitat Loss and Disturbance

- Extent: Local, limited to the site and near surroundings
- Duration: Short term (construction phase), Long term (operations phase)
- Likelihood: High
- Intensity: High (construction phase) and Low (operations phase)
- Post-mitigation significance rating: Moderate (construction phase), Minor (operation phase)

Post- mitigation significance rating is the same for both alternatives

Loss of Landscape Connectivity

- Extent: Local, limited to the site and near surroundings
- Duration: Short term (construction phase), Long term (operations phase)
- Likelihood: High
- Intensity: Medium, as just more than 20ha of vegetation will be cleared for the PV arrays, therefore a small portion of the site will be disturbed, and none of the ecologically sensitive areas will be disturbed by the PV array footprint
- Post-mitigation significance rating: Minor

Post- mitigation significance rating is the same for both alternatives

Disturbance to birds

Preferred Alternative

- Extent: Local, affecting birds outside the development footprint
- Duration: Long-term, birds will be impacted for duration of project lifespan
- Likelihood: High
- Intensity: Low
- Post-mitigation significance rating: Minor

Employment Opportunities:

Construction Phase: 40-60 full time jobs with 5 percent of positions skilled.

Operation Phase: 10-20 full time jobs with 20 percent of positions skilled.

- Extent: Local, provincial and national level depending on skills and capacity availability.
- Duration: Long-term employment opportunities will extend for the duration of the construction phase and operation phase.
- Likelihood: High
- Intensity: Medium. Although in absolute terms, a small number of jobs will be created, the impact of these jobs will be higher in the community in relative terms considering the high unemployment levels in the community. In 2007, the employment rate for Municipality was estimated at 43 percent, 16 percent were unemployed and the remaining 41 percent were economically inactive ⁽⁴⁾.
- Post-mitigation significance rating: Moderate (positive)

Post- mitigation significance rating is the same for both alternatives

Unmet Stakeholder Expectations:

- Extent: Local communities are likely to have the highest expectations around employment opportunity .
- Duration: Short-term, it is likely that this will only occur during the construction phase.
- Likelihood: Medium
- Intensity: Low
- Post-mitigation significance rating: Minor (negative)

Post- mitigation significance rating is the same for both alternatives

Increased Social Ills Linked to Influx of Job Seekers

- Extent: Local and provincial level depending on skills and capacity availability.
- Duration: Short-term, there may be an initial influx of workers seeking employment during the construction phase.
- Likelihood: Medium
- Intensity: Low
- Post-mitigation significance rating: Minor (negative)

Post- mitigation significance rating is the same for both alternatives

Visual:

(4) Economically inactive population refers to students, elderly, sick, differently-abled persons and people who choose not to work.

Alternative S1:

- Extent: Local
- Duration: Long-term, impacts will extend for the duration of the development
- Likelihood: High
- Intensity: Medium to Low, The proposed energy facilities will be clearly visible from the 705 Route, but surrounding farmsteads and settlements are either too far from the site, or are in a view shadow.
- Post-mitigation significance rating: Moderate- Low

Alternative S2:

- Extent: Local
- Duration: Long-term, impacts will extend for the duration of the development
- Likelihood: High
- Intensity: Medium to Low, The proposed energy facilities will be clearly visible from the 705 Route, but surrounding farmsteads and settlements are either too far from the site, or are in a view shadow.
- Post-mitigation significance rating: Moderate- Low

Alternative S3:

- Extent: Local
- Duration: Long-term, impacts will extend for the duration of the development
- Likelihood: High
- Intensity: High; The proposed energy facilities will be adjacent to the R705.
- Post-mitigation significance rating: Moderate

Traffic

- Extent: Local
- Duration: Medium term, impacts will be present for the construction phase and there will be minor traffic impacts in the operational phase.
- Likelihood: High
- Intensity: Medium,
- Post-mitigation significance rating: Minor as the increased traffic flow can be managed following the mitigation measures set above.

Post- mitigation significance rating is the same for both alternatives

Palaeontology

- Extent: Local
- Duration: n/a
- Likelihood: Low
- Intensity: Low, as there is little evidence of palaeontological resources at the site.
- Post-mitigation significance rating: Minor

Post- mitigation significance rating is the same for both alternatives

Archaeology

- Extent: Local
- Duration: n/a

- Likelihood: Low
- Intensity: Low
- Post-mitigation significance rating: Minor

Post- mitigation significance rating is the same for both alternatives

Built Heritage Environment

- Extent: Local
- Duration: n/a
- Likelihood: Low
- Intensity: Low, as the proposed development footprint will avoid any sensitive heritage sites.
- Post-mitigation significance rating: Minor

Post- mitigation significance rating is the same for both alternatives

Cultural Heritage Landscape

Alternative S1

- Extent: Local
- Duration: Long term
- Likelihood: Low
- Intensity: Low, as the proposed project is a relatively small development with a minor visual impact on the landscape.
- Post-mitigation significance rating: Minor

Cultural Heritage Landscape

Alternative S2

- Extent: Local
- Duration: Long term
- Likelihood: Low
- Intensity: Low, as the proposed project is a relatively small development with a minor visual impact on the landscape.
- Post-mitigation significance rating: Minor

Cultural Heritage Landscape

Alternative S3

- Extent: Local
- Duration: Long term
- Likelihood: Low
- Intensity: Medium, as this Alternative will have the greatest impact on the landscape.
- Post-mitigation significance rating: Moderate.

No-go alternative (compulsory)

The no-go alternative is the option of not implementing the activity or executing the proposed development. Assuming that the PV power facility would not be developed at the proposed site, the site would remain in its current state. There would be no negative environmental and social impacts associated with the development of a solar power facility. The agricultural potential

(although limited for this site) would not be lost due to the establishment of the facility on agricultural land. Similarly, there would be no positive impacts if the PV power facility is not executed; there will be no increase in electricity generation, no CO₂ offsets associated with the proposed development, no economic benefit to the landowners associated with the potential income generated through the operation of the facility and there would be no contribution to meeting South Africa's targets for renewable energy generation.

The direct benefits associated with the both the construction and operational phases of the PV power facility such as increased employment opportunities and associated economical benefits would also not occur should the development not go ahead.

SECTION E. RECOMMENDATION OF 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 ✓	NO
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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:

CONSTRUCTION PHASE MITIGATION

General

An Environmental Control Officer (ECO) should be appointed. The responsibilities of the ECO should include monitoring and reporting as well as ensuring that the development takes place within the guidelines set out in the EMPr (Appendix F).

Noise

- Equipment will be fitted with silencers where possible.
- Mechanical equipment with lower sound power levels would be selected to ensure that the permissible occupation noise-rating limit of 85 dBA is not exceeded. Construction workers and personnel would wear hearing protection when required.
- Vehicles and machines will be properly serviced and well maintained.
- Vehicles must adhere to speed limits, and not exceed 40km/h.
- A Grievance Procedure (included in EMPr) will be established whereby noise complaints by neighbours are recorded and responded to.

Dust

- Dust control methods such as wetting the surface should be implemented.
- Vehicles travelling on unpaved or gravel roads must not exceed a speed of 40 km/hr.
- Stockpiles of dusty materials must be enclosed or covered by suitable shade cloth or netting to prevent escape of dust during loading and transfer from site.
- All directly affected and neighbouring farmers must be able to lodge grievances with Solar

Reserve using the Grievance Procedure (included in the EMP) regarding dust emissions that could be linked to the project.

Destruction and Loss of Grazing Capacity and Agricultural Potential:

Mitigation:

- Ensure that as little pollution or other non-physical disturbance occurs, and that the deeper, productive irrigated areas near the river are not affected (either directly or indirectly) in any way.
- Damage to farmland caused by construction activities will be minimized by ensuring strict compliance with construction plans by minimizing the development footprint and to implement a 'Code of Conduct' governing workers.
- The design of the infrastructure layout will be in a manner that limits the footprint of the facility and all associated infrastructure.
- Any damage to vegetation outside the design of the project footprint will be rehabilitated in accordance with mitigation proposed for proposed for the rehabilitation of vegetation in the EMP.
- Vehicles will only drive on demarcated roads.

Waste:

- All wastes produced from project activities on site will be transferred to designated temporary storage areas and where possible into secure containers.
 - Solid wastes will be segregated to facilitate reuse and recycling of specific materials.
 - All wastes that cannot be reused or recycled will be collected by approved waste contractors and transferred to an appropriately licensed waste management facility for treatment and disposal.
- All project generated wastes will need to be managed and disposed of in a manner to prevent potential impacts on the environment and risks to human health. A Waste Management Plan (WMP) for the proposed project will be developed. This will follow the principles of waste minimisation at source, segregation for reuse, recycling, treatment or disposal.
- It is recommended that all concrete mixing be undertaken on impermeable plastic lining to prevent contamination of the soils and surrounding areas.
 - Construction solid waste will be managed via a Construction Environmental Management Plan (EMP) and will incorporate reduction, recycling and re-use principles.
 - The contractor will remove refuse collected from the working areas at the site at least once a week.
 - All builders' rubble generated during the construction phase shall be removed from the site at least once a week to a licensed landfill site.
 - Fuels on site will be stored in a locked container within a fenced and secure temporary staging area.
 - Trucks and construction vehicles will be serviced off site.
 - The use, storage, transport and disposal of hazardous materials used for the project will be carried out in accordance with all applicable South African regulations.
 - Material Safety Data Sheets for all applicable materials present on site will be readily available to on site personnel.
 - It is proposed that the construction contracting company supply the required temporary ablation facilities and be responsible for the removal and treatment thereof. Solar Reserve will be responsible to ensure that the contracting company is accredited and has the necessary permits to remove the sewage. The sewage will be treated in accordance with the municipal sewage works policies and guidelines.

Soil Degradation and Erosion:

Mitigation:

- Wherever possible, roads and tracks should be constructed so as to run along the contour.
- All roads and tracks running down the slope must have water diversion structures present.
- Any extensive cleared areas that are no longer or not required for construction activities should be re-seeded with locally-sourced seed of suitable species. Bare areas can also be packed with brush removed from other parts of the site, encourage natural vegetation regeneration and limit erosion.
- No construction vehicles should be allowed to drive around the veld (open site area). All construction vehicles should remain on properly demarcated roads.
- All hazardous materials should be stored in the appropriate manner to prevent contamination of the site.
- The storage area needs to be bunded with a capacity of 110% of the tank volume; tanks and associated infrastructure need to be inspected regularly.
- 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.

Surface Water and Groundwater

- 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.
- Vehicles will be serviced and maintained off site.

Ecology

- Vegetation clearing to be kept to a minimum.
- All areas to be cleared should be clearly demarcated.
- Sensitive areas as demarcated on the sensitivity map should be avoided, and where such areas occur within or near the development area, they should be clearly demarcated as no-go areas.
- Soil disturbance and vegetation clearing should be kept to a minimum.
- Cleared areas that are not going to be used should be revegetated with locally-collected seeds of indigenous species.
- Regular monitoring to ensure that alien plants are not increasing as a result of disturbance that has taken place.
- Any fauna directly threatened by the construction activities should be removed to a safe location by the Environmental Control Officer (ECO). This must be supervised by an appropriately qualified ecological specialist.
- The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Any personnel found collecting, hunting or harvesting of any plants or animals will be removed from the project permanently and removed from the site immediately.
- 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.
- 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.
- Fencing should be constructed in manner which allows for the passage of small and medium sized mammals. Steel palisade fencing (20 cm gaps min) is a good option in this regard as it allows most medium-sized mammals to pass between the bars, but remains an effective obstacle for humans. Alternatively the lowest strand or bottom of the fence should be elevated to 15 cm above the ground at least at strategic places to allow for fauna to pass under the fence.

-If electrified strands are to be used, there should be no strands within 30 cm of the ground because tortoises retreat into their shells when electrocuted and eventually succumb from repeated shocks.

Socio- Economic Impacts

-The labour contract between Solar Reserve and Subcontractors who are appointed to provide services will specify local labour employment criteria, e.g. percentage of total workforce.

-Ensure that the appointed project contractors and suppliers have access to appropriate training (including Health, Safety, Environmental and Quality) as required by the Project. This will help to ensure that they have future opportunities to provide goods and services to the sector.

-Solar Reserve will develop a Procurement and Recruitment Policy which sets reasonable targets for the employment of South African and local residents /suppliers (originating from the local municipality) and promote the employment of women as a means of ensuring that gender equality is attained. Criteria must be set for prioritising, where possible, local (local Municipal) residents/suppliers over regional or national people/suppliers.

-Initial recruitment and training for local personnel will take place prior to and during the construction phase.

-No employment will take place at the entrance to the site. Only formal channels for employment will be used.

Visual

-Avoid development of solar energy facilities or related infrastructure to the south of the main koppie on the site, and on the slopes of the koppie.

-Maintain visual buffers of at least 30 to 50m from the external farm boundaries.

-Avoid drainage courses as determined by the hydrologist, as these are also natural features in the landscape.

-Locate all cables and power lines underground as far as possible.

-Cluster the substation, maintenance and storage buildings together if possible, and locate these close to the existing power lines. Buildings should be located in low-lying areas and not on hillslopes or high ground.

-The design of the buildings should be compatible in scale and form with rural buildings of the surrounding area. All yards and storage areas should be enclosed by masonry walls.

-The construction camp, material stores and lay-down area should be screened from the 705 district road and preferably located in the vicinity of the proposed maintenance buildings to minimise disturbance.

-The extent of the construction camp and stores should be limited in area to only that which is essential.

-Disturbed areas rather than pristine or intact landscape areas should preferably be used for the construction camp.

-Borrow pits for the construction are assumed to be from local approved sites. New borrow pits would be subject to permits from the relevant authorities, and should preferably not be visible from the 705 Route.

Traffic

Impacts associated with the higher traffic volumes can be accommodated by proper site management, by controlling the size of orders that would be transported to the site at any given time and by notifying the public through local and regional media centres when large freight-carrying vehicles will be on the roads.

Palaeontology, Archaeology and Cultural Heritage

-No palaeontological mitigation is required as the proposed development is positioned well away from the Riet River or any tributaries and thus, the impact on palaeontological material is negligible (rated Low or negative);

-However, the ECO responsible for the development must remain aware that all sedimentary deposits have the potential to contain fossils and he/she should thus monitor all substantial excavations into sedimentary bedrock for fossil remains. If any fossils are found during construction, SAHRA should be notified immediately;

-With regard archaeological resources, it is recommended that no construction should be allowed on the koppies to the north or south of the proposed facility. This includes access roads, underground cabling or powerlines. This will ensure that the rock engravings which are found on the dolerite boulders on top of the hills, as well as stone kraals abutting the hills, are not destroyed;

-No mitigation measures are recommended with regard the Built Environment;

-If any human remains are uncovered during the construction of the site, work should stop in that area, and the SAHRA Burials Unit should be notified. They will investigate and propose a way forward;

-It is recommended that the facility is constructed to the north of the southern koppies to ensure that it is not visible from the R705. It is anticipated that the visual impact of the facility on the Cultural Landscape of the area will be low, but this will need to be verified by the visual specialist.

Indirect Impacts

-The labour contract between Solar Reserve and Subcontractors who are appointed to provide services during the construction phase of the development will specify local labour employment criteria, e.g. percentage of total workforce.

-Solar Reserve will develop a Procurement and Recruitment Policy which sets reasonable targets for the employment of South African and local residents /suppliers (originating from the local municipality) and promote the employment of women as a means of ensuring that gender equality is attained. Criteria must be set for prioritising, where possible, local (local municipal) residents/suppliers over regional or national people/suppliers.

-Initial recruitment and training for local personnel will take place prior to and during the construction phase.

-No employment will take place at the entrance to the site. Only formal channels for employment will be used.

-Solar Reserve will undertake clear communication with all stakeholders regarding realistic employment opportunities .

OPERATIONAL PHASE MITIGATIONNoise

No additional mitigation measures apart from the mitigation measures for the construction phase have been suggested as there are no sensitive receptors close to the site.

Waste

-Designated waste bins will be provided and regularly taken to the municipal waste stream

-Separate bins will be provided for recycling material and general waste.

Soil Degradation and Erosion:

- All hazardous materials will be stored in the appropriate manner to prevent contamination of the site.
- The storage area needs to be bunded with a capacity of 110% of the tank volume; tanks and associated infrastructure need to be inspected regularly.
- Any accidental chemical, fuel and oil spills that occur at the site will be cleaned up in the appropriate manner as related to the nature of the spill.
- Regular monitoring will be undertaken for erosion to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. All erosion problems observed will be rectified as soon as possible.
- All maintenance vehicles to remain on the demarcated roads.

Socio- economic Impacts

- The labour contract between Solar Reserve and Subcontractors who are appointed to provide services will specify local labour employment criteria, e.g. percentage of total workforce.
- Solar Reserve will develop a Procurement and Recruitment Policy which sets reasonable targets for the employment of South African and local residents /suppliers (originating from the local municipality) and promote the employment of women as a means of ensuring that gender equality is attained. Criteria must be set for prioritising, where possible, local (local Municipal) residents/suppliers over regional or national people/suppliers.
 - Ensure that the appointed project contractors and suppliers have access to appropriate training (including Health, Safety, Environmental and Quality) as required by the Project. This will help to ensure that they have future opportunities to provide goods and services to the sector.

Visual

- Avoid development of solar energy facilities or related infrastructure to the south of the main koppie on the site, and on the slopes of the koppie.
- Maintain visual buffers of at least 30 to 50m from the external farm boundaries.
- Avoid drainage courses as determined by the hydrologist, as these are also natural features in the landscape.
- Locate all cables and power lines underground as far as possible.
- Cluster the substation, maintenance and storage buildings together if possible, and locate these close to the existing power lines. Buildings should be located in low-lying areas and not on hillslopes or high ground.
- The design of the buildings should be compatible in scale and form with rural buildings of the surrounding area. All yards and storage areas should be enclosed by masonry walls.
- The construction camp, material stores and lay-down area should be screened from the 705 district road and preferably located in the vicinity of the proposed maintenance buildings to minimise disturbance.
- The extent of the construction camp and stores should be limited in area to only that which is essential.
- Disturbed areas rather than pristine or intact landscape areas should preferably be used for the construction camp.
- Borrow pits for the construction are assumed to be from local approved sites. New borrow pits would be subject to permits from the relevant authorities, and should preferably not be visible from the 705 Route.

Destruction and Loss of Grazing Capacity and Agricultural Potential

- Vehicles for maintenance will only drive on demarcated roads.

Impacts on Surface Water and Groundwater:

- All hazardous materials will be stored in the appropriate manner to prevent contamination of the site.
- Any accidental chemical, fuel and oil spills that occur at the site will be cleaned up in the appropriate manner as related to the nature of the spill.
- Vehicles will be serviced and maintained off site.
- No chemical additives will be used in undertaking the cleaning of PV panels.

Ecology

- All maintenance crew to be aware that no plants or animals may be interfered with.
- No unauthorised personnel to be allowed onto the site.
- All alien plants present at the site should be controlled annually using the best practice methods for the species present.
- Regular monitoring to ensure that alien plants are not increasing as a result of all the disturbance that has taken place.
- No unauthorized persons should be allowed onto the site.
- 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.
- The collection, hunting or harvesting of any plants or animals at the site will be strictly forbidden. Any personnel found collecting, hunting or harvesting of any plants or animals will be removed from the project permanently and removed from the site immediately.
- Fires will only be allowed within fire-safe demarcated areas.
- No fuelwood collection will be allowed on-site.
- No dogs will be allowed on site.
- All hazardous materials will be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site will be cleaned up in the appropriate manner as related to the nature of the spill.
- Ensure that no larger fauna enter and become trapped within the fenced-off area, either by leaving a gate open so that animals can move freely between the site and the adjacent farm or by keeping all gates closed to ensure that they are excluded.
- Attaching spikes and other deterrents to specific positions on the structures, to prevent birds from perching in areas with an electrocution risk.
- Bird flappers to be used on the powerline.

DECOMMISSIONING PHASE MITIGATION

Noise

The same mitigation measures as stipulated for the construction phase will apply.

Dust

The same mitigation measures as the construction phase will apply.

Waste

- All of the mitigation measures as stipulated for the construction phase will apply.
- All wastes and PV power facility components that can be recycled will be recycled.

Soil Degradation and Erosion:

- Any extensive cleared areas remaining will be re-seeded with locally-sourced seed of suitable

species. Bare areas can also be packed with brush removed from other parts of the site, encourage natural vegetation regeneration and limit erosion.

-No decommissioning vehicles will be allowed to drive around the veld (open site area). All vehicles will remain on properly demarcated roads.

-All hazardous materials will be stored in the appropriate manner to prevent contamination of the site.

-The storage area needs to be bunded with a capacity of 110% of the tank volume; tanks and associated infrastructure need to be inspected regularly.

-Any accidental chemical, fuel and oil spills that occur at the site will be cleaned up in the appropriate manner as related to the nature of the spill.

Impacts on Surface Water and Groundwater:

All of the mitigation measures stipulated for the construction phase will apply during the decommissioning phase.

Ecology

-Vegetation clearing to be kept to a minimum.

-All areas to be cleared will be clearly demarcated.

-Sensitive areas as demarcated on the sensitivity map will be avoided and clearly demarcated as no-go areas.

-The entire PV power facility footprint will be rehabilitated to its original state before the project

-Soil disturbance and vegetation clearing will be kept to a minimum.

-Cleared areas will be revegetated with locally-collected seeds of indigenous species.

-Any fauna directly threatened by the decommissioning activities will be removed to a safe location by the Environmental Control Officer (ECO). This must be supervised by an appropriately qualified ecological specialist.

-The collection, hunting or harvesting of any plants or animals at the site will be strictly forbidden. Any personnel found collecting, hunting or harvesting of any plants or animals will be removed from the project permanently and removed from the site immediately.

-Fires will only be allowed within fire-safe demarcated areas.

-No fuelwood collection will be allowed on-site.

-No dogs will be allowed on site.

-All hazardous materials will be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site will be cleaned up in the appropriate manner as related to the nature of the spill.

Visual

-Any temporary decommissioning camp, material stores and lay-down area will be screened as far as possible from the local roads.

-The extent of the temporary decommissioning camp and stores will be limited in area to only that which is essential.

-Land that has been damaged by the project will be rehabilitated and revegetated.

-Disturbed areas rather than pristine or intact landscape areas will preferably be used for the temporary decommissioning camp.

Traffic

All mitigation stipulated in the construction phase will apply.

Palaeontology, Archaeology and Cultural Heritage

-No paleontological mitigation is required as the impact on paleontological material is

considered negligible (rated Minor or negative).
 -The ECO responsible for the development must remain aware that all sedimentary deposits have the potential to contain fossils and he/she should thus monitor all substantial excavations into sedimentary bedrock for fossil remains. If any fossils are found during decommissioning, SAHRA will be notified immediately.
 -No mitigation measures are recommended with regard the Built Environment.
 -If any human remains are uncovered during the decommissioning of the site, work will stop in that area and the SAHRA Burials Unit will be notified. They will investigate and propose a way forward.

Socio- economic Impacts

-Ensure that the appointed project contractors and suppliers have access to appropriate training (including Health, Safety, Environmental and Quality) as required by the Project. This will help to ensure that they have future opportunities to provide goods and services to the sector.

Is an EMPr attached?

YES ✓	NO
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The EMPr must be attached as Appendix F.

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Comments and responses report

Appendix F: Environmental Management Programme (EMPr)

Appendix G: Public Participation Documentation

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