

PROJECT DETAIL

DEA Reference No.	:	14//12/16/3/3/1/1551
Project Title	:	Proposed expansion of the Waterloo Photovoltaic Solar Energy Facility near Vryburg, North West Province.
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Client	:	DPS79 Solar Energy (RF) (Pty) Ltd.
Report Status	:	Final Basic Assessment Report
Submission date	:	29 June 2016

When used as a reference this report should be cited as: Environamics (2016) Final BAR: Proposed expansion of the Waterloo Photovoltaic Solar Energy Facility near Vryburg, North West Province.

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TABLE OF CONTENTS

PROJECT DETAIL.....	1
TABLE OF CONTENTS.....	2
APPENDICES	4
CONTEXT FOR THE DEVELOPMENT	7
EXECUTIVE SUMMARY	8
SECTION A: ACTIVITY INFORMATION	13
1. PROJECT DESCRIPTION.....	13
a) Describe the project associated with the listed activities applied for.....	13
b) Provide a detailed description of the listed activities associated with the project as applied for.....	15
2. FEASIBLE AND REASONABLE ALTERNATIVES	16
3. PHYSICAL SIZE OF THE ACTIVITY	22
4. SITE ACCESS.....	22
5. LOCALITY MAP	23
6. LAYOUT/ROUTE PLAN	23
7. SENSITIVITY MAP	23
8. SITE PHOTOGRAPHS.....	24
9. FACILITY ILLUSTRATION	24
10. ACTIVITY MOTIVATION	25
11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES	33
12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT.....	43
13. WATER USE	45
14. ENERGY EFFICIENCY	46
SECTION B: SITE/AREA/PROPERTY DESCRIPTION.....	48

1.	GRADIENT OF THE SITE	49
2.	LOCATION IN LANDSCAPE	49
3.	GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE	49
4.	GROUNDCOVER	50
5.	SURFACE WATER.....	50
6.	LAND USE CHARACTER OF SURROUNDING AREA.....	51
7.	CULTURAL/HISTORICAL FEATURES	52
8.	SOCIO-ECONOMIC CHARACTER	53
9.	BIODIVERSITY	54
 SECTION C: PUBLIC PARTICIPATION		58
1.	ADVERTISEMENT AND NOTICE	58
2.	DETERMINATION OF APPROPRIATE MEASURES.....	58
3.	ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES	59
4.	COMMENTS AND RESPONSE REPORT.....	59
5.	AUTHORITY PARTICIPATION	60
6.	CONSULTATION WITH OTHER STAKEHOLDERS	64
 SECTION D: IMPACT ASSESSMENT		65
1.	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	65
2.	ENVIRONMENTAL IMPACT STATEMENT	85
 SECTION E. RECOMMENDATION OF PRACTITIONER		86
REFERENCES		88

APPENDICES

APPENDIX A: MAPS

- Figure 1: Locality Map
- Figure 2: Regional Map
- Figure 3: Land Capability Map
- Figure 4: Site Development Plan (SDP)
- Figure 5: Environmental sensitivity Map
- Figure 6: Vegetation Map

APPENDIX B: PHOTOGRAPHS

APPENDIX C: FACILITY ILLUSTRATION(S)

APPENDIX D: SPECIALIST REPORTS (INCLUDING TERMS OF REFERENCE)

- Appendix D1: Heritage Impact Assessment
- Appendix D2: Avifaunal Impact Assessment
- Appendix D3: Ecological Fauna and Flora Habitat Survey
- Appendix D4: Soil, Land Capability and Agricultural Potential Study
- Appendix D5: Palaeontological Impact Assessment
- Appendix D6: Geotechnical Study
- Appendix D7: Hydrogeological Report
- Appendix D8: Visual Impact Assessment
- Appendix D9: Social Impact Assessment

APPENDIX E: PUBLIC PARTICIPATION

- Appendix E1: Advertisements and notices
- Appendix E2: Proof of notification (other than organs of state)
- Appendix E3: Comments and response report
- Appendix E4: Proof of notification (organs of state)
- Appendix E5: List of registered I&APs
- Appendix E6: Copies of any correspondence

- Appendix E7: Public Meeting

APPENDIX F: IMPACT ASSESSMENT

- Appendix F1: Checklist Analysis
- Appendix F2: Matrix Analysis
- Appendix F3: Assessment Methodology
- Appendix F4: Significance rating of potential impacts

APPENDIX G: ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

APPENDIX H: DETAILS OF EAP AND EXPERTISE

APPENDIX I: SPECIALIST'S DECLARATION OF INTEREST

APPENDIX J: ADDITIONAL INFORMATION

GLOSSARY OF TERMS AND ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
DEA	Department of Environmental Affairs
DM	District Municipality
DoE	Department of Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPFI	Equator Principles Financial Institutions
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
GNR	Government Notice Regulation
I&AP	Interested and affected party
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
NLM	Naledi Local Municipality
kV	Kilo Volt
Mitigate	Activities designed to compensate for unavoidable environmental damage.
MW	Megawatt
NEMA	National Environmental Management Act No. 107 of 1998
NERSA	National Energy Regulator of South Africa
NWA	National Water Act No. 36 of 1998
PPP	Public Participation Process
PV	Photovoltaic
REIPPP	Renewable Energy IPP Procurement Process
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework

CONTEXT FOR THE DEVELOPMENT

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

The primary rationale for the proposed solar photovoltaic (PV) facility is to add new generation capacity from renewable energy to the national electricity mix and to aid in achieving the goal of 42% share of all new installed generating capacity being derived from renewable energy forms, as targeted by DoE (Integrated Resource Plan Update 2010-2030). In terms of the Integrated Resource Plan Update (IRP Update, 2010-2030), over the short term (of the next two or three years), clear guidelines arose; namely to continue with the current renewable bid programme with additional annual rounds of 1000 MW PV, with approximately 8.4GW of the renewable energy capacity planned to be installed from PV technologies over the next twenty years.

To contribute towards this target and to stimulate the renewable energy industry in South Africa, the need to establish an appropriate market mechanism was identified, and the Renewable Energy IPP Procurement (REIPPP) process was announced in August 2012, with the intention of DoE to purchase 3,750MW of renewable energy from IPPs to be delivered to the national grid by end of 2016 under a 20-year Power Purchase Agreement to be signed with Eskom. The establishment of the REIPPP process in South Africa provides the opportunity for an increased contribution towards the sustained growth of the renewable energy sector in the country, the region and internationally, and promote competitiveness for renewable energy with conventional energies in the medium- and long-term.

In response to the above, DPS79 Solar Energy (RF) (Pty) Ltd. is in the process of developing a photovoltaic solar facility and associated infrastructure for the purpose of commercial electricity generation on an identified site located near Vryburg in the North West Province. An EIA for the Waterloo Solar Energy facility was conducted in 2012 and the project obtained an environmental authorisation (EA) on 28 March 2013. DPS79 Solar Energy was selected as a preferred bidder by the Department of Energy early in 2015. Construction of the solar plant is said to start early in 2016; however, in order to reach a generation capacity of 75MW the approved area of 150 hectares (the "Original Waterloo Site") will have to be expanded. This application therefore relates to the expansion of the Waterloo Solar Energy facility (refer to Figure 1 for the locality map). From a regional site selection perspective, this region is preferred for solar energy development due to its global horizontal irradiation value of 1780 kWh/m²/annum.

EXECUTIVE SUMMARY

Like many other small and developing municipalities in the country, the Naledi Local Municipality faces a number of challenges in addressing the needs of the community while planning for a sustainable future (IDP, 2012-17). The Naledi Local Municipality's (NLM) Integrated Development Plan (IDP, 2012-17) reveals the following key weaknesses for the municipality: municipal financial viability; growing unemployment; generally declining economy; lack of industrial development in Vryburg; infrastructural neglect and service backlogs; and lack of a proper Land Use Management System. The following key threats are also identified: increasing urbanization of rural part of NLM population; environmental degradation; high unemployment and poverty levels; large housing backlogs; lack of capital to provide and maintain services infrastructure. The IDP does not explicitly deal with renewable energy development, but the Naledi local economic development (LED) however identifies carbon-footprint reduction, including supporting alternative energies, as LED programmes for the NLM.

In response to the above a 75MW PV Solar facility, namely the Waterloo Solar Energy facility as developed by DPS79 Solar Energy (RF) (Pty) Ltd. was proposed and consequently approved on the farm Waterloo 992, Registration Division IN, North West situated within the Naledi Local Municipality area of jurisdiction (the "Original Waterloo Site"). This application relates to the expansion of the approved project. The additional site will comprise an area of 19.9 hectares (including supporting infrastructure on site) to generate approximately 19.9 MW. The site proposed for expansion is located adjacent to the western boundary of the Original Waterloo Site. The town of Vryburg is located approximately 7km north west of the proposed development (refer to Figure 1 and 2 for the locality and regional map). The site was identified as being highly desirable due to its suitable climatic conditions, topography (i.e. in terms of slope), environmental conditions (i.e. agricultural potential, ecological sensitivity and archaeology), proximity to a grid connection point (i.e. for the purpose of electricity evacuation), as well as site access (i.e. to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase).

The Environmental Impact Assessment (EIA) Regulations, 2014 (Regulation 982) determine that an environmental authorisation is required for certain listed activities, which might have detrimental effects on the environment. The following activities have been identified with special reference to the proposed development and are listed in the EIA Regulations:

- Activity 1(i) (GN.R. 983): *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is more than 10 megawatts but less than 20 megawatts..."*
- Activity 27 (GN.R. 983): *"The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation..."*
- Activity 36(ii) (GN. R. 983): *"The expansion of facilities or structures for the generation of electricity from a renewable resource where the electricity output will be increased by 10 megawatts..."*

megawatts or more and regardless the output of the facility, the development footprint, the development footprint will be expanded by 1 hectare or more...”

- Activity 4(i)(ee) (GN.R. 985): *“The development of a road wider than 4 metres with a reserve less than 13.5 metres outside urban areas, in critical biodiversity areas (Terrestrial Type 1 and 2) as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plan.”*
- Activity 12(a)(ii) (GN.R. 985): *“The clearance of an area of 300 square metres or more of indigenous vegetation...(a) in North West (ii) within critical biodiversity areas identified in bioregional plans.”*

Being listed under Listing Notice 1 and 3 (Regulation 983 & 985) implies that the development is considered as potentially having a significant impact on the environment. Subsequently a ‘thorough assessment process’ is required as described in Regulations 21-24. Environamics has been appointed as the independent consultant to undertake the EIA on DPS79 Solar Energy’s behalf.

Regulation 29 of the EIA Regulations requires that a basic assessment report must contain all the information that is necessary for a proper understanding of the nature of issues identified. The potential positive and negative impacts associated with the proposed activity have been identified. The potentially most significant environmental impacts associated with the development are briefly summarized below:

Impacts during the construction phase:

During the construction phase, minor negative impacts are foreseen over the short term, being a period of months. The potentially most significant impacts relate to the impacts on the fauna and flora and socio-economic impacts such as the provision of temporary employment and other economic benefits.

Impacts during the operational phase:

During the operational phase the study area will serve as a solar PV energy facility and the potential impacts will take place over a period of 20 – 25 years. The negative impacts are generally associated with impacts on the increased consumption of water. The provision of sustainable services delivery also needs to be confirmed. The operational phase will have a direct positive impact through the provision of employment opportunities for its duration, and the generation of income to the local community.

Impacts during the decommissioning phase:

The physical environment will benefit from the closure of the solar facility since the site will be restored to its natural state. The decommissioning phase will result in the loss of permanent employment. However, skilled staff will be eminently employable and a number of temporary jobs will also be created during the decommissioning phase.

Cumulative impacts:

Cumulative impacts could arise as other similar projects are constructed in the area. According to the Energy Blog's database the Waterloo Solar Energy facility is the only plant that was granted preferred bidder status near Vryburg. However, according to the Department's database seven (7) applications for solar plants have been submitted in relative close proximity to the proposed activity. Environamics and other environmental consultants are also in the process of applying for Environmental Authorisation for eight (8) PV projects in the area.

The potential for cumulative impacts may therefore exist. The Basic Assessment Report (BAR) includes a detailed assessment of the potential cumulative impacts associated with the proposed development. Potential cumulative impacts with a significance rating of negative medium relate to: loss or fragmentation of indigenous natural fauna and flora, loss or fragmentation of habitats, physical and chemical degradation of the soils by construction vehicles (hydrocarbon spills), impacts of the geology on the proposed development, generation of waste, temporary employment opportunities, visual intrusion, impact of construction workers on local communities, and an influx of job seekers during the construction phase. Cumulative impact (-Medium) during the operational phase relate to: soil erosion, visual intrusion, generation of additional electricity, and the establishment of a community trust. The following cumulative impact (-Medium) were identified as potentially significant during the decommissioning phase: visual intrusion and the generation of waste.

Regulation 19 of the EIA Regulations determines that the environmental impacts and mitigation measures as well as the residual risks of the proposed activity be set out in the Basic Assessment Report (BAR). This BA evaluates and rates each identified impact, and identifies mitigation measures which will be required. This BA also contains information that is necessary for the competent authority to consider the application and to reach a decision contemplated in Regulation 20.



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

Application Number:

Date Received:

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, 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, 2014 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. This report format is current as of **08 December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. 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.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. 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.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. 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.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

13. 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.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

SECTION A: ACTIVITY INFORMATION

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 the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

THE LOCATION OF THE ACTIVITY AND PROPERTY DESCRIPTION

The activity entails the expansion of the Waterloo Solar Energy facility and associated infrastructure on the farm Waterloo 992, Registration Division IN, North West situated within the Naledi Local Municipality area of jurisdiction. The proposed development is located in the North West Province (refer to Figure 2 for the regional map). The town of Vryburg is located approximately 7km north west of the proposed site (refer to Figure 1 for the locality map).

The project entails the expansion of the footprint of the project with approximately 19.9 hectares (including supporting infrastructure on site) – refer to 1 for general site information. The property on which the facility is to be constructed will be leased by DPS79 Solar Energy (RF) (Pty) Ltd. from the property owner, Chris van Zyl Trust, for the life span of the project (minimum of 20 years).

Table 1: General site information

Description of affected farm portion	Waterloo 992, Registration Division IN, North West
21 Digit Surveyor General codes	TOIN00000000099200000
Title Deed	T2995/1998
Photographs of the site	Refer to the Plates
Type of technology	Photovoltaic solar facility
Structure Height	Panels ~3.5m, buildings ~ 4m
Surface area to be covered	Less than 19.9 hectares
Structure orientation	The panels will either be fixed to a single-axis horizontal tracking structure where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.
Laydown area dimensions	Less than 19.9 hectares
Generation capacity	19.9MW

The site is located in a rural area and is bordered by farms. The site survey revealed that the site currently consists of grazing for cattle – refer to plates 1-14 for photographs of the development area. The property on which the development is to be established is owned by the Chris van Zyl Trust.

PHOTOVOLTAIC TECHNOLOGY

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

- PV Panel Array - To produce 19.9MW, the proposed facility will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted at a northern angle in order to capture the most sun.
- Wiring to Central Inverters - Sections of the PV array will be wired to central inverters. The inverter is a pulse width mode inverter that converts direct current (DC) electricity to alternating current (AC) electricity at grid frequency.
- Connection to the grid - Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33kV to 132kV. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter is 480V and this is fed into step up transformers to 132kV. An onsite substation will be required on the site to step the voltage up to 132kV, after which the power will be evacuated into the national grid. The generation from the facility will tie in with the Mookodi Substation. The Project will inject up to 75MW into the Substation.
- Roads – Ready access already exist from the Amalia gravel road off of the R34. All site roads will require a width of approximately 5-6m.
- Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm.

LAYOUT DESCRIPTION

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

SERVICES PROVISION

Adequate provision of water will be a prerequisite for the development. Water for the proposed development will most likely be obtained from ground water resources or alternatively from the municipality. The Department of Water Affairs confirmed the water resource availability in the relevant catchment management area in order to ensure sustainable water supply in a letter dated 16 November 2012.

The site falls within the C32 quaternary drainage region, this drainage region falls under Zone C,

which refers to the amount of water that may be taken from the ground water resource per hectare, per annum. According to the Revision of General Authorisations in terms of Section 39 of the National Water Act of 1998 (Act No. 36 of 1998), Zone C indicates that 75 m³ of water per hectare may be taken from these drainage regions per annum. The proposed site will cover an area of approximately 170 hectares, which in effect means that a total of 11 250m³ of water may be abstracted from a ground water resource without applying for a Water Use License. This means that the water use will only need to be registered with the Department of Water and Sanitation to obtain a General Authorisation regarding the abstraction of ground water.

The estimated maximum amount of water required during construction is 200m³ per month during the 12 months of construction. The estimated maximum amount of water required during the facility's 20 years of production is 3 000m³ per annum. The majority of this usage is for the cleaning of the solar panels. Since each panel requires approximately 2 liters of water for cleaning, the total amount of 350 000 panels will require 700 000 liters per wash. It is estimated that the panels may only need to be washed twice per annum, but provision is made for quarterly cleaning (March, May, July, and September). This totals approximately 2,800,000 liters per annum for washing, and allows 200,000 liters per annum (or 548 liters per day) for toilet use, drinking water, etc. Drinking water supplied will comply with the SANS:241 quality requirements and it is noted that the Naledi Local Municipality remains the Water Service Authority in that area of jurisdiction.

Generally, the water supply does not require the construction of a reverse osmosis plant. This is however dependant on the quality of the water, or what the mineral content is. Should a reverse osmosis plant be required, brine (the excess minerals) will be formed during the filtration process that will be stored and then removed. Determining baseline water quality conditions is important in order to appropriately manage incidents in the future. Water saving devices and technologies such as the use of dual flush toilets and low-flow taps, the management of storm water, the capture and use of rainwater from gutters and roofs should be considered by the developer. Furthermore, indigenous vegetation will be used during landscaping and the staff will be trained to implement good housekeeping techniques.

Portable chemical toilets will be utilized, that will be serviced privately or by the local municipality. Waste will be disposed at a licensed waste site (such as Hoopstad, Vryburg, Wolmaranstad, Wesselsbron, Warrenton or Welkom). The construction and hazardous waste (if any) will be removed to licensed landfill sites accepting such kinds of wastes. During the operational phase household waste will be removed to a licensed landfill site by a private contractor or by the local municipality. The Naledi Local Municipality has formally confirmed on 16 November 2012 that they have the capacity to provide the proposed development with these services for the lifetime of the project (25 years).

b) Provide a detailed description of the listed activities associated with the project as applied for

Detailed description of listed activities associated with the project	
Listed activity as described in GN R 983 and 985	Description of project activity
GNR. 983, 4 Dec. 2014, Activity 1(i): <i>"The development of facilities or infrastructure"</i>	Activity 1(i) is triggered since the proposed photovoltaic solar facility will produce 19.9

<i>for the generation of electricity- (i) from a renewable resource where the electricity output is more than 10 megawatts but less than 20 megawatts.”</i>	megawatts of electricity.
<u>GNR. 983, 4 Dec. 2014, Activity 27:</u> <i>“The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation...”</i>	Activity 27 is triggered since 19.9 hectares of indigenous vegetation will be removed.
<u>GNR. 983, 4 Dec. 2014, Activity 36:</u> <i>“The expansion of facilities or structures for the generation of electricity from a renewable resources where- (i) the electricity output will be increased by 10 megawatts or more and (ii) regardless the output of the facility, the development footprint will be expanded by 1 hectare or more...”</i>	Activity 36 is triggered since the existing Waterloo Solar Energy facility covering an area of 150 hectares will be expanded by 19.9 hectares in order to generate 75MW.
<u>GNR. 985, 4 Dec. 2014, Activity 4(ii)(ee):</u> <i>“The development of a road wider than 4 metres with a reserve less than 13.5 metres (e) in North West (ii) outside urban areas in (ee) critical biodiversity areas as identified in bioregional plans...”</i>	An internal site road network to provide access to the solar field and associated infrastructure will be required. All site roads will require a width of approximately 5-6m. Therefore, activity 4(ii)(ee) is triggered since the site is located outside an urban area and within a critical biodiversity area.
<u>GNR. 985, 4 Dec 2014, Activity 12(ii):</u> <i>“The clearance of an area of 300 square metres or more of indigenous vegetation...(ii) within critical biodiversity areas identified in bioregional plans in the North West Province.</i>	Activity 12(ii) is triggered since 19.9 hectares of indigenous vegetation will be removed within a critical biodiversity area.

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 as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) 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.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
<p>This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed expansion. This portion of the farm Waterloo 992 is preferred due to its proximity to the already approved EIA for the Waterloo Solar Energy facility and its location in terms of environmental sensitivities (avoiding any).</p> <p>The proposed development falls within an area used for grazing and the site is therefore considered to have limited environmental sensitivity as a result. The National Department of Agriculture (2006) classified land capability into two broad categories, namely land suited to cultivation (Classes I – IV) and land with limited use, generally not suited to cultivation (Classes V – VIII). The site falls within Class VI and therefore the agricultural potential of the site is limited and it is unlikely that the change in land use will impact significantly on agricultural production.</p>	Top Left: 27° 02' 27,87" S	24° 46' 36,07" E
	Top Right: 27° 02' 23,71" S	24° 46' 45,56" E
	Bottom Left: 27° 02' 47,89" S	24° 46' 46,04" E
	Bottom Right: 27° 02' 43,26" S	24° 46' 55,67" E
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

Alternative:

Alternative S1 (preferred)

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

Alternative S2 (if any)

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

Alternative S3 (if any)

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

Latitude (S):

Longitude (E):

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.

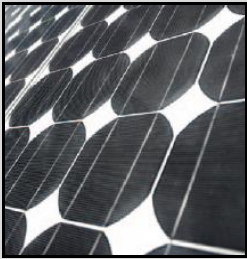

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

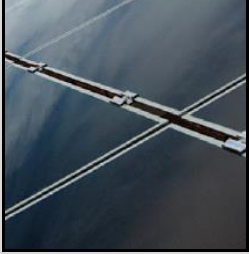


b) Lay-out alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
<p>Design alternatives were considered throughout the planning and design phase (i.e. what would be the best design option for the development?). In this regard discussions on the design were held between the EAP and the developer. The layout follows the limitations of the site and aspects such as environmental sensitive areas, roads, fencing and servitudes are considered – refer to Appendix A. The total surface area proposed for layout options include the PV panel arrays spaced to avoid shadowing, access and maintenance roads and associated infrastructure (buildings, power inverters, transmission lines and perimeter fences).</p> <p>With regards to the structure orientation, the panels will either be fixed to a single-axis horizontal tracking structure where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.</p>	Top Left: 27° 02' 27,87" S	24° 46' 36,07" E
	Top Right: 27° 02' 23,71" S	24° 46' 45,56" E
	Bottom Left: 27° 02' 47,89" S	24° 46' 46,04" E
	Bottom Right: 27° 02' 43,26" S	24° 46' 55,67" E

Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

c) Technology alternatives

Alternative 1 (preferred alternative)
<p>There are several types of semiconductor technologies currently available and in use for PV solar panels. Two, however, have become the most widely adopted, namely crystalline silicon and thin film. These technologies are discussed in more detail below:</p> <p><u>Crystalline (high efficiency technology at higher cost):</u></p> <p>Crystalline silicon panels are constructed by first putting a single slice of silicon through a series of processing steps, creating one solar cell. These cells are then assembled together in multiples to make a solar panel. Crystalline silicon, also called wafer silicon, is the oldest and the most widely used material in commercial solar panels. Crystalline silicon modules represent 85-90% of the global annual market today. There are two main types of crystalline silicon panels that can be considered for the solar facility:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;">  </div> <div style="width: 65%;"> <ul style="list-style-type: none"> • Mono-crystalline Silicon - mono-crystalline (also called single crystal) panels use solar cells that are cut from a piece of silicon grown from a single, uniform crystal. Mono-crystalline panels are among the most efficient yet most expensive on the market. They require the highest purity silicon and have the most involved manufacturing process. </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 30%;">  </div> <div style="width: 65%;"> <ul style="list-style-type: none"> • Poly-crystalline Silicon – poly-crystalline panels use solar cells that are cut from multifaceted silicon crystals. They are less uniform in appearance than mono-crystalline cells, resembling pieces of shattered glass. These are the most common solar panels on the market, being less expensive than mono-crystalline silicon. They are also less efficient, though the performance gap has begun to close in recent years (First Solar, 2011). </div> </div> <p><u>Thin film (low-cost technology with lower efficiency):</u></p> <p>Thin film solar panels are made by placing thin layers of semiconductor material onto various surfaces, usually on glass. The term <i>thin film</i> refers to the amount of semiconductor material used. It is applied in a thin film to a surface structure, such as a sheet of glass. Contrary to popular belief, most thin film panels are not flexible. Overall, thin film solar panels offer the lowest manufacturing costs, and are becoming more prevalent in the industry. Thin films currently account for 10-15% of global PV module sales. There are three main types of thin film used:</p>

	<ul style="list-style-type: none"> • Cadmium Telluride (CdTe) - CdTe is a semiconductor compound formed from cadmium and tellurium. CdTe solar panels are manufactured on glass. They are the most common type of thin film solar panel on the market and the most cost-effective to manufacture. CdTe panels perform significantly better in high temperatures and in low-light conditions.
	<ul style="list-style-type: none"> • Amorphous Silicon - Amorphous silicon is the non-crystalline form of silicon and was the first thin film material to yield a commercial product, first used in consumer items such as calculators. It can be deposited in thin layers onto a variety of surfaces and offers lower costs than traditional crystalline silicon, though it is less efficient at converting sunlight into electricity.
	<ul style="list-style-type: none"> • Copper, Indium, Gallium, Selenide (CIGS) - CIGS is a compound semiconductor that can be deposited onto many different materials. CIGS has only recently become available for small commercial applications, and is considered a developing PV technology (First Solar, 2011).
<p>The technology that (at this stage) proves more feasible and reasonable with respect to the proposed solar facility is Polycrystalline silicon panels, due to it being non-reflective, more efficient, and with a higher durability.</p>	
<p>Alternative 2</p>	
<p>Alternative 3</p>	

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

<p>Alternative 1 (preferred alternative)</p>
<p>Technical alternatives</p>
<p>No technical alternatives are available for the expansion of the Waterloo Solar Energy facility as the transmission lines do not form part of this assessment.</p>
<p>Alternative 2</p>
<p>Alternative 3</p>

e) No-go alternative

This alternative considers the option of ‘do nothing’ and maintaining the status quo. The description provided in section B of this report could be considered the baseline conditions (status

quo) to persist should the no-go alternative be preferred. Should the proposed activity not proceed, the site will remain unchanged and will continue to be used for low density cattle grazing (refer to plates for photographs of the site). However, the potential opportunity costs in terms of the additional electricity generated as part of the already approved Waterloo Solar Energy facility would be lost.

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

3. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:

- Alternative A1¹ (preferred activity alternative)
- Alternative A2 (if any)
- Alternative A3 (if any)

Size of the activity:

19.9 hectares
m ²
m ²

or, for linear activities:

Alternative:

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

Length of the activity:

m
m
m

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

Alternative:

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

Size of the site/servitude:

m ²
m ²
m ²

4. SITE ACCESS

Does ready access to the site exist?

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

Describe the type of access road planned:

YES	NO
	m

Access to the site will be obtained from the gravel road off the regional road (R34). An internal site road network to provide access to the solar field and associated infrastructure will also be required. All site roads will require a width of approximately 5-6m.

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.

¹ "Alternative A.." refer to activity, process, technology or other alternatives.

5. LOCALITY MAP

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

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- 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 locality map has been included as part of this report as **Appendix A – Figure 1.**

6. LAYOUT/ROUTE PLAN

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

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

A layout plan (site development plan) has been included as part of this report as **Appendix A – Figure 4.**

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);

- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

The layout plan has been overlain with the sensitivity map and has been included as **Appendix A – Figure 5**.

8. 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 report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

Site photograph from the centre of the site taken in the eight major compass directions have been included as **Appendix B**.

9. FACILITY ILLUSTRATION

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

A facility illustration has been included as part of this report within **Appendix C**.

Table 2: Technical Details for the proposed facility:

Component	Description / dimensions
Height of PV panels	3.5 meters
Area of PV Array	170 Hectares (including expansion)
Number of 1071kW inverters required	71
Area occupied by inverter / transformer stations / substations	Inverter Transformer Station: 2.5 x 7.6 meters (19m ²) Substation: 25 x 14 meters (350m ²)
Capacity of on-site substation	132kV
Area occupied by buildings	Security Room: 66.74 m ² Office: 157.6 m ² Staff Locker and Changing Room: 213.745 m ²
Length of internal roads	Approximately 9 km
Width of internal roads	Approximately 4.5 meters
Height of fencing	Approximately 2.5 meters
Type of fencing	Cochrane Clearvu

10. ACTIVITY MOTIVATION

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

1. Is the activity permitted in terms of the property's existing land use rights?	YES	NO	Please explain
The current zoning of the site is "Agricultural". A rezoning application has been lodged to change the zoning to "Special".			
2. Will the activity be in line with the following?			
a) Provincial Spatial Development Framework (PSDF)	YES	NO	Please explain
The North West is rated as the fourth largest electricity consuming province in South Africa and consumes approximately 12% of the available electricity. This is mainly due to the high demand of the electrical energy-intensive mining and related industrial sector. Approximately 63% of the electricity supplied to the North West Province is consumed in its mining sector. The North West Province Growth and Development Strategy includes a renewable energy strategy which aims to improve the Province's environment, reduce the Province's contribution to climate change, and alleviate energy poverty, whilst promoting economic development and job creation in the province whilst developing its green economy.			
According to the North West Province Spatial Development Framework (2012), specific manufacturing sub-sectors with special reference to renewable energy manufacturing will help create new employment opportunities and sustain jobs by 2030, which will represent 22.7% of the total provincial employment. They encourage this sector to maintain an average growth rate of 8.7% between now and 2030 which will ensure a Gross Value Added (GVA) increase in this time.			
(b) Urban edge / Edge of Built environment for the area	YES	NO	Please explain
The proposed project falls outside the urban edge. However, it is the norm for solar farms to be located outside urban areas. It is not foreseen that the proposed development will result in urban sprawl.			

<p>(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).</p>	YES	NO	Please explain
<p>The Naledi Local Municipality's (NLM) Integrated Development Plan (IDP, 2012-17) reveals the following key priority areas for the municipality: municipal financial viability; growing unemployment; generally declining economy; lack of industrial development in Vryburg; infrastructural neglect and service backlogs; and lack of a proper Land Use Management System. The following key threats are also identified: increasing urbanization of rural part of NLM population; environmental degradation; high unemployment and poverty levels; large housing backlogs; lack of capital to provide and maintain services infrastructure. The IDP does not explicitly deal with renewable energy development, but the Naledi local economic development (LED) however identifies carbon-footprint reduction, including supporting alternative energies, as LED programmes for the NLM.</p> <p>The access to electricity in the Naledi Local Municipality increased from 62% in 2001 to 77% in 2011 and according to the District Municipality IDP of 2012-2017 the population of the Naledi Local Municipality increased from 54 116 in 1996 to 66 781 in 2011, placing increased strain on the need for household electricity.</p> <p>It is therefore foreseen that the development will address some of the key issues identified by the NLM IDP, thereby improving the economy, providing employment opportunities, providing local renewable energy sources and contributing to the growth of the renewable energy sector in the NLM.</p>			
<p>(d) Approved Structure Plan of the Municipality</p>	YES	NO	Please explain
<p>The proposed project entails electricity infrastructure, which is compatible with the Naledi Local Municipality IDP (2012-2017).</p>			
<p>(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)</p>	YES	NO	Please explain
<p>No EMF has been compiled for the area. The North West Biodiversity Conservation Assessment can be used to guide priority areas in the terms of Conservation. The conservation importance of the study area can be described as moderate due to the fact that there is a possibility of protected species occurring in this vegetation community (Acacia erioloba, Brunsvigia radula and Aloe grandidentata). Although no protected plant species were found were found at the study sites within the study area, they are present in this vegetation community outside of the study area.</p>			
<p>(f) Any other Plans (e.g. Guide Plan)</p>	YES	NO	Please explain
<p>Besides the North West Biodiversity Conservation Assessment and the 2012-2017 IDP, no other plans are known to guide the development.</p>			

<p>3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?</p>	YES	NO	Please explain
<p>The main purpose of the development is to generate electricity from a renewable resource. The project is not specifically considered within the approved municipal SDF. However, the municipality identified basic service delivery such as electricity, job creation and economic growth as priorities within the SDF both locally and within the district municipality. The proposed development will assist in achieving these objectives.</p>			
<p>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</p>	YES	NO	Please explain
<p>The evacuation of additional power will serve to improve the stability of the national grid. The proposed project will also assist the government in achieving the goal of 17GW renewable energy production as part of the electricity generation technology mix by 2030.</p> <p>The proposed development will benefit the local community through job creation, skills development opportunities and training which will, in turn, assist in reducing poverty levels that the area is currently facing, and indirectly strengthen electricity supply in the area.</p> <p>DPS79 Solar Energy (RF) (Pty) Ltd. together with the Naledi Local Municipality will also investigate the establishment of a Community Development Trust from which the community may benefit.</p>			
<p>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix E6.)</p>	YES	NO	Please explain
<p>The Naledi Local Municipality has formally confirmed on 16 November 2012 that they have the capacity to provide the proposed development with the following services for the lifetime of the project (25 years). The increase in the land area covered by solar panels will not lead to an increase of the services required.</p>			

<p>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix E6.)</p>	YES	NO	Please explain
<p>The proposed project is to be developed by a private developer and not the municipality. It therefore does not fall within the infrastructure planning of the municipality. It will not require any capacity for services such as water and sanitation, but will however improve electricity supply in the area.</p>			
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	YES	NO	Please explain
<p>Within the policy framework, the development of renewable energy in South Africa is supported by the White Paper on Renewable Energy (November 2003). In order to meet the long-term goal of a sustainable renewable energy industry, a goal of 17.8GW generated through renewables by 2030 has been set by the Department of Energy (DoE) within the Integrated Resource Plan (IRP) 2010. This energy will be produced mainly from wind, solar, biomass, and small-scale hydro (with wind and solar comprising the bulk of the power generation capacity). This amounts to approximately 42% of all new power generation being derived from renewable energy forms by 2030. This is however dependant on the assumed learning rates and associated cost reductions from renewable options. The proposed Waterloo Solar Energy Facility will feed directly into the national grid and the proposed power line will facilitate this connection and the development of renewable energy infrastructure.</p>			
<p>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</p>	YES	NO	Please explain
<p>The proposed site for the development of the Waterloo Solar Energy Facility expansion is located west of the Waterloo Solar Energy Facility that will be constructed in 2016. Solar PV technology is furthermore perfectly suited to the site, given the high irradiation values for the Vryburg area.</p>			
<p>9. Is the development the best practicable environmental option for this land/site?</p>	YES	NO	Please explain
<p>There is no dry land or irrigated crop production due to the limitations of soil forms present (mostly restricted soil depth and to a lesser degree soil chemistry) as well as the limiting climate (moderately low and erratic rainfall). The site has potential for extensive cattle or game farming with an average grazing capacity of 3.67ha/LSU. It can be concluded that should the development be authorised, it will have a low negative impact on agricultural potential in terms of cattle production in the area, and no negative impact on crop production.</p> <p>Given the low agricultural potential of the property and the environmental benefit gained from generating electricity from a renewable resource, a solar energy facility is the best practicable environmental option for this land.</p>			

10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES	NO	Please explain
<p>The negative impacts associated with the proposed activity include localised impacts on vegetation, soil and land use and are expected to be limited to the development footprint, and are not considered to be of high significance (refer to section D). All impacts can be managed to an acceptable level, as outlined in the Environmental Management Programme.</p> <p>Positive impacts associated with the facility include i) generation of electricity from a renewable resource and also reduces reliance (although limited) on conventional power sources such as coal; ii) local economic upliftment and job creation; iii) and the reduction of the carbon footprint associated with electricity production. These positive impacts will extend beyond the boundary of the site and are expected to outweigh the negative impacts.</p>			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES	NO	Please explain
<p>A large number of applications for the development of PV solar facilities have been proposed in the Naledi Local Municipality. The project will be one of the first solar power projects in the local municipality thereby setting precedents for future projects.</p>			
12. Will any person's rights be negatively affected by the proposed activity/ies?	YES	NO	Please explain
<p>The proposed project will take place on privately owned land and will be leased by DPS79 Solar Energy (RF) (Pty) Ltd. for the lifetime of the project. All surrounding landowners have been notified of the proposed project and have been registered as I&AP's. No infrastructure will extend beyond the boundaries of the farm. Therefore, no rights of any person will be negatively affected. However, I&APs were notified of the proposed development – refer to Appendix E.</p>			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES	NO	Please explain
<p>The project is located approximately 7 km from the town of Vryburg and will not comprise the urban edge, since people will still be residing in the nearby town.</p>			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPs)?	YES	NO	Please explain
<p>The proposed development will form part of SIP 8: Green energy in support of the South African economy. Waterloo Solar Energy Facility has already been selected as a preferred bidder project by the DoE.</p>			

15. What will the benefits be to society in general and to the local communities?	Please explain
<p>Job opportunities will be created during the construction and operational phases of the project. In addition, local and regional economic benefits would be realised through the additional revenue generated as a result of the proposed project (through direct and indirect job opportunities, local spend, local procurement, etc.)</p> <p>The primary benefit to society in general will be a reduction in the use of non-renewable resources for the generation of power, contributing to a sustainable environment and development.</p>	
Any other need and desirability considerations related to the proposed activity?	Please explain
<p>The proposed activity is a direct result of the growing demand for electricity and the need for renewable energy in South Africa. According to Eskom, the demand for electricity in South Africa has been growing at approximately 3% per annum. This growing demand, fuelled by increasing economic growth and social development, is placing increasing pressure on South Africa's existing power generation capacity. Coupled with this, is the growing awareness of environmental responsible development, the impacts of climate change and the need for sustainable development.</p> <p>The facility's contribution towards sustainable development and the associated benefits to society in general is discussed below:</p> <ul style="list-style-type: none"> • <u>Lesser dependence on fossil fuel generated power</u> - The deployment of the facility will have a positive macro-economic impact by reducing South Africa's dependence on fossil fuel generated power and assisting the country in meeting its growing electricity demand. • <u>Increased surety of supply</u> - By diversifying the sources of power in the country, the surety of supply will increase. The power demands of South Africa are ever increasing and by adding solar power this demand can be met, even exceeded without increasing pollution in relation to the use of fossil fuels. The project has the potential of "securing" economic activity by assisting in removing supply constraints if Eskom generation activities result in a supply shortfall. When supply is constrained it represents a limitation to economic growth. When a supply reserve is available, it represents an opportunity for economic growth. • <u>Local economic growth</u> - The proposed project will contribute to local economic growth by supporting industry development in line with provincial and regional goals and ensuring advanced skills are drawn to the North West Province. The project will likely encounter widespread support from government, civil society and businesses, all of whom see potential opportunities for revenues, employment and business opportunities locally. 	

The development of the photovoltaic solar facility will in turn lead to growth in tax revenues for local municipalities and sales of carbon credits, resulting in increased foreign direct investment.

- Lower costs of alternative energy - An increase in the number of solar facilities commissioned will eventually reduce the cost of the power generated through solar facilities. This will contribute to the country's objective of utilising more renewable energy and less fossil fuel based power sources. It will assist in achieving the goal to generate 10 000 GWh of electricity from renewable energy by 2015 and the reduction of South Africa's GHG emissions by approximately 34% below the current emissions baseline by 2020.
- Reduction in greenhouse gas emissions - The additional power supplied through solar energy will reduce the reliance on the combustion of fossil fuels to produce power. The South African electricity grid is predominantly coal-fired and therefore GHG emissions intensive (coal accounts for more than 92% of the fuel used in South Africa's electricity generation). The reduction of GHG emissions as a result of the project implementation will be achieved due to reduction of CO₂ emissions from combustion of fossil fuel at the existing grid-connected power plants and plants which would likely be built in the absence of the project activity.
- CDM Project - A solar energy facility also qualifies as a Clean Development Mechanism (CDM) project (i.e. a financial mechanism developed to encourage the development of renewable technologies).
- Climate change mitigation - On a global scale, the project makes a contribution to greenhouse gas emission reduction and therefore contributes toward climate change mitigation.
- Reduced environmental impacts - The reduction in electricity consumed from the grid will not only result in a reduction in greenhouse gas emissions, but also the prevention of negative impacts associated with coal mining. For example, coal power requires high volumes of water, in areas of South Africa where water supply is already over-stretched and water availability is highly variable. Photovoltaic solar energy technology also does not produce the sulphur emissions, ash or coal mining concerns associated with conventional coal fired electricity generation technologies resulting in a relatively low level of environmental impacts. It is a clean technology which contributes toward a better quality environment for employees and nearby communities.
- Social benefits - The project activity is likely to have significant long-term, indirect positive social impacts that may extend to a regional and even national scale. The larger scale impacts are to be derived in the utilization of solar power and the experience gained through the construction and operation of the power plant. In future, this experience can be employed at other similar solar installations in South Africa.
- Provision of job opportunities - The main benefit of the proposed development operating in the area is that local companies or contractors will be hired for the duration of the construction period. The operational phase will provide permanent job opportunities to the local communities from the surrounding area since security guards and general labourers will be required on a full time basis. Approximately 350 employment opportunities will be created during the construction and operational phases.

- Indirect socio-economic benefits - The increase in the demand for services such as accommodation, transportation, security, general maintenance and catering will generate additional indirect socio-economic benefits for the local community members.

16. How does the project fit into the National Development Plan for 2030?

Please explain

By 2030 South Africa aims to reduce carbon emissions, promote economic development and increase the GDP. This project will fit into this vision since it aims to contribute towards the electricity supply through renewable resources. The solar facility with which the activities are associated will assist in reducing the country's carbon footprint, as it will be generating renewable energy, and will facilitate the infrastructure growth in the area through employment and infrastructure.

17. Please describe how the general objectives of Integrated Environmental Management (IEM) as set out in section 23 of NEMA have been taken into account.

The objectives of IEM as set out in section 23 of NEMA have been considered and integrated into this Basic Assessment Report and in the EMPr for the project. The potential impacts on the biophysical and socio-economic environments have been identified, assessed and evaluated, and mitigation measures have been proposed where applicable in the EMPr for the project. The BAR, through its consideration of project alternatives as well as identification and assessment of positive and negative impacts on the environment and the incorporation of mitigation measures to manage these impacts, will facilitate responsible decision making by the relevant authorities.

To guide the planning process for the proposed Waterloo Solar Energy Facility Extension, the following studies were commissioned:

- Heritage Impact assessment (**Appendix D1**).
- Avifaunal Study (**Appendix D2**).
- Ecological Fauna and Flora Habitat Survey (**Appendix D3**).
- Soil, Land Capability and Agricultural Potential Study (**Appendix D4**)
- Palaeontological Impact Assessment (**Appendix D5**)
- Geotechnical Study (**Appendix D6**)
- Hydrogeological Report (**Appendix D7**)
- Visual Impact Assessment (**Appendix D8**)
- Social Impact Assessment (**Appendix D9**)

Through inputs from the EAP and specialists during the Basic Assessment process, sufficient information has been made available to ensure that all impacts to the surrounding environment have been adequately considered and incorporated into this report and into the EMPr for decision making. All public participation requirements in terms of the 2014 EIA Regulations will be met during the course of the Basic Assessment process.

18. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

The principles of environmental management as set out in Section 2 of NEMA briefly relates to: ecosystems and biological diversity, prevention of pollution and degradation, protecting cultural heritage, waste management, resource use & equitable access, risk-averse and cautious approach, anticipating and preventing negative impacts, best practicable environmental option, environmental justice, participation & transparency, and inter-governmental co-ordination. These principles formed the basis for assessment of impacts throughout the EIA process.

11. 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:

Table 3: Legislative context for the construction of photovoltaic solar plants

LEGISLATION	ADMINISTERING AUTHORITY	DATE	SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT
The Constitution of South Africa (Act No. 108 of 1996)	National Government	1996	The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 states that “everyone has the right to (a) an environment that is not harmful to their health or well-being and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution therefore, compels government to give effect to the people’s environmental right and places government under a legal duty to act as a responsible custodian of the countries environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.
The National Environmental Management Act (Act No. 107 of 1998)	National and Provincial Department of Environmental Affairs	1998	<p>NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice.</p> <p>The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 982, 983, 984, and 985 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment. This EIA was triggered by activity 1(i), activity 27 and activity 36(i)(ii) listed in Regulation R983, activities 4(i)(ee) and 12(a)(ii) listed in Regulation R985, which requires a ‘basic assessment process.’</p>
The National Energy Act (Act No. 34 of 2008)	Department of Minerals and Energy	2008	One of the objectives of the National Energy Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including solar: “To ensure that diverse energy resources are available, in sustainable quantities, and at affordable

			prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (...); to provide for (...) increased generation and consumption of renewable energies..." (Preamble).
The National Water Act (Act No. 36 of 1998)	Department of Water Affairs (DWA)	1998	<p>Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources.</p> <p>As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use.</p> <p>It has been determined that the site falls within the C32 quaternary drainage region. This drainage region falls under Zone C, which refers to the size of the property on which the Water use license is applicable. According to the Revision of General Authorisations in terms of Section 39 of the National Water Act of 1998 (Act No. 36 of 1998), Zone C indicates that 75m³ of water per hectare may be taken from this drainage region per annum. However, it should be noted that the Waterloo Solar Energy facility is in the process of obtaining a Water Use Licence for stream crossings, proximity to wetlands and abstraction of ground water as part of the General Authorisation process.</p>
National Environmental Management: Waste Act (Act No. 59 of 2008)	Department of Environmental Affairs (DEA)	2008	<p>NEMWA has been developed as part of the law reform process enacted through the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS). The objectives of the Act relate to the provision of measures to protect health, well-being and the environment, to ensure that people are aware of the impact of waste on their health, well-being and the environment, to provide for compliance with the measures, and to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.</p> <p>Regulations No. R921 (of 2013) promulgated in terms of Section 19(1) of the National Environmental Management: Waste Act (59 of 2008) determine that no person may commence, undertake or</p>

			conduct a waste management activity listed in this schedule unless a license is issued in respect of that activity. It is not envisaged that a waste permit will be required for the proposed development.
National Environment Management: Air Quality Act (Act No. 39 of 2004)	Department of Environmental Affairs (DEA)	2004	<p>The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development.</p> <p>Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1)(a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development.</p>
The National Heritage Resources Act (Act No. 25 of 1999)	South African Heritage Resources Agency (SAHRA)	1999	<p>The Act aims to introduce an integrated and interactive system for the management of the heritage resources, to promote good government at all levels, and empower civil society to nurture and conserve heritage resources so that they may be bequeathed to future generations and to lay down principles for governing heritage resources management throughout the Republic. It also aims to establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources, to set norms and maintain essential national standards and to protect heritage resources, to provide for the protection and management of conservation-worthy places and areas by local authorities, and to provide for matters connected therewith.</p> <p>The Act protects and manages certain categories of heritage resources in South Africa. For the purposes of the Heritage Resources Act, a “heritage resource” includes any place or object of cultural significance. In this regard the Act makes provision for a person undertaking an activity listed in Section 28 of the Act to notify the resources authority. The resources authority may request that a heritage impact assessment be conducted if there is reason to believe that heritage resources will be affected. A case file has been opened on SAHRIS and all relevant documents will be submitted for their comments.</p>
Conservation of Agricultural Resources Act	National and Provincial Government	1983	The objective of the Act is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

(Act No. 85 of 1983)			Consent will be required from the Department of Agriculture in order to confirm that the proposed development is not located on high potential agricultural land and to approve the long term lease agreement.
Notional Forests Act (Act No.84 of 1998)	Department of Agriculture, Forestry and Fisheries	1998	<p>In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions may be stipulated).</p> <p>This list of protected tree species was published in GN877 of 22 November 2013. There is a possibility of protected species occurring in this vegetation community as <i>Acacia erioloba</i> were found in the vegetation community outside of the study area, although none were found at the study sites within the study area.</p>
National Veld and Forest Fire Act (Act 101 of 1998)	Department of Agriculture, Forestry and Fisheries	1998	<p>This Act provides requirements for veldfire prevention through firebreaks and required measures for fire-fighting. Chapter 4 places a duty on landowners to prepare and maintain firebreaks, and Chapter 5 places a duty on all landowners to acquire equipment and have available personnel to fight fires.</p> <p>In terms of S12 the landowner would be obliged to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land. In terms of S12 the firebreaks would need to be wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of flammable material. In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires.</p> <p>While no permitting or licensing requirements arise from this legislation, this Act will find application during the operational phase of the project in terms of fire prevention and management.</p>

Table 4: Policy context for the construction of solar PV plants

POLICY	ADMINISTERING AUTHORITY	DATE	SUMMARY / IMPLICATIONS FOR PROPOSED DEVELOPMENT
The White Paper on the Energy Policy of the Republic of South Africa	Department of Minerals and Energy	1998	<p>The White Paper on the Energy Policy of the Republic of South Africa establishes the international and national policy context for the energy sector, and identifies the following energy policy objectives:</p> <ul style="list-style-type: none"> • Increasing access to affordable energy services • Improving energy governance

			<ul style="list-style-type: none"> • Stimulating economic development • Managing energy-related environmental and health impacts • Securing supply through diversity • Energy policy priorities <p>The White Paper sets out the advantages of renewable energy and states that Government believes that renewables can in many cases provide the least cost energy service, particularly when social and environmental costs are included. The White Paper acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country’s renewable energy resource base is extensive and many appropriate applications exist.</p> <p>The White Paper notes that renewable energy applications have specific characteristics that need to be considered. Advantages include minimal environmental impacts in operation in comparison with traditional supply technologies; and generally lower running costs, and high labour intensities.</p> <p>Disadvantages include:</p> <ul style="list-style-type: none"> • Higher capital costs in some cases; • Lower energy densities; and • Lower levels of availability, depending on specific conditions, especially with sun and wind based systems.
<p>The White Paper on Renewable Energy</p>	<p>Department of Minerals and Energy</p>	<p>2003</p>	<p>This White Paper on Renewable Energy supplements the <i>White Paper on Energy Policy</i>, which recognizes that the medium and long-term potential of renewable energy is significant. This Paper sets out Government’s vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.</p> <p>The White Paper notes that while South Africa is well-endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. Government’s long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidised alternative to fossil fuels. The medium-term (10-year) target set in the White Paper is: <i>10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation</i></p>

			<i>and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1667 MW) of the projected electricity demand for 2013 (41539 MW) (Executive Summary, ix).</i>
Integrated Resource Plan (IRP) for South Africa	Department of Minerals and Energy	2010-2030	<p>The current iteration of the Integrated Resource Plan (IRP) for South Africa, after a first round of public participation in June 2010, led to the Revised Balanced Scenario (RBS) that was published in October 2010. The document outlines the proposed generation new build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on the cost-optimal solution for new build options, which was then “balanced” in accordance with qualitative measures such as local job creation. In addition to all existing and committed power plants, the RBS included a nuclear fleet of 9,6GW; 6,3GW of coal; 11,4GW of renewables; and 11,0GW of other generation sources.</p> <p>A second round of public participation was conducted in November/December 2010, which led to several changes to the IRP model assumptions. The main changes were the disaggregation of renewable energy technologies to explicitly display solar photovoltaic (PV), concentrated solar power (CSP) and wind options; the inclusion of learning rates, which mainly affected 39renewable; and the adjustment of investment costs for nuclear units (a possible increase of 40%).</p> <p>Additional cost-optimal scenarios were generated based on the changes. The outcomes of these scenarios, in conjunction with the following policy considerations, led to the Policy-Adjusted IRP:</p> <ul style="list-style-type: none"> • The installation of 39renewable were brought forward in order to accelerate a local industry; • To account for the uncertainties associated with the costs of 39renewable and fuels, a nuclear fleet of 9,6GW was included in the IRP; • The emission constraint of the RBS (275 million tons of carbon dioxide per year after 2024) was maintained; and • Energy efficiency demand-side management (EEDSM) measures were maintained at the level of the RBS. <p>The Policy-Adjusted IRP includes the same amount of coal and nuclear new builds as the RBS, while reflecting recent developments with respect to prices for 39renewable. In addition to all existing and committed power plants (including 10GW committed coal), the plan includes 9,6GW of nuclear; 6,3GW of coal; 17,8GW of 39renewable; and 8,9GW of other generation sources. The Policy-Adjusted IRP has therefore resulted in an increase in the contribution from 39renewable from 11,4 GW to 17,8 GW.</p>
North West Province	North West	2004 -	The Strategy (PGDS) provides a framework for integrated and sustainable growth and economic development for the province and its people over the next ten years. It addresses the formulation of a

Growth and Development Strategy	Provincial Government	2014	<p>common vision, goals and objectives of what should be achieved and how the provincial government and its social partners should achieve its objectives.</p> <p>The PGDS notes that the NWP is a medium-size province, covering ~10% of the total national surface area, accounting for ~8% of the national population, and contributing ~7% to the national economy. With the exception of the mining sector (~23.5% of provincial GDP in 2002), private sector activity in the NWP is very modest. Other development challenges include low population densities; inadequate infrastructure, and enormous service delivery backlogs; a predominantly poor population with high levels of illiteracy and dependency; great inequalities between rich and poor, and disparities between urban and rural; and the HIV/Aids pandemic.</p> <p>Both the primary immediate and long term objectives of the PGDS are therefore to address poverty and unemployment, while simultaneously improving the low level of expertise and skills. Additional objectives include promoting equal and fair access to opportunities and assets; enhancing competitiveness, profitability and SMME development; and ensuring sustainable development.</p>
Dr. Ruth Segomotsi Mompoti District Municipality Integrated Development Plan (IDP)	Dr. Ruth Segomotsi Mompoti District Municipality	2012 - 2017	<p>The IDP serves as the basic developmental framework and the basis for annual reviews of municipal performance for the period up to 2017. The IDP is explicitly aligned with the requirements of the Municipal Systems Act (2000) and the developmental objectives outlined in the National Priority Outcomes, and the National Medium Term Strategic Framework (2009). Identified key intervention priority areas include:</p> <ul style="list-style-type: none"> • More inclusive economic growth, decent work and sustainable livelihoods; • Developing economic and social infrastructure; • Rural development, food security and land reform; • Improving access to quality education; • Improved health care; • Fighting crime and corruption; • Sustainable resource management and use. <p>A situation analysis of the DM indicates, amongst others, the following key developmental challenges:</p> <ul style="list-style-type: none"> • The DM’s largely African population generally suffers from low education, low income and high unemployment levels, and many have minimal access to water and sanitation;

			<ul style="list-style-type: none"> • A mainly youthful African population, with a correspondingly small labour force cohort, and hence high levels of youthful dependency; • High functional illiteracy amongst the African population group; • Great dependency upon government as employer in the DM, and therefore the crucial need to develop the private sector (mainly in agriculture and mining), and develop the Small Medium Micro Enterprise (SMME) sector both in the formal and informal sectors. <p>Renewable energy is not directly addressed, but the IDP does indicate the transition to a low carbon economy as a DM goal, and recommends that the DM speeds up and expands renewable energy (generation) (DRSMDM, 2012: 114).</p>
<p>Naledi Local Municipality Integrated Development Plan (IDP) Review</p>	<p>Naledi Local Municipality</p>	<p>2012-2017</p>	<p>The Naledi IDP includes a municipal turnaround strategy (“Municipal Plan”) in response to the NLM’s current financial non-viability, and consequent inability to fully meet its developmental and service delivery obligations. The IDP is aligned with key national and provincial developmental policy, including the National Priority Outcomes and the NWP PGDS.</p> <p>The IDP is informed by a SWOT analysis of the Naledi LM. Key identified NLM Strengths include: a strong agricultural sector in a high capacity beef grazing area; the most diverse and dominant economy in the DRSMDM; strategic location with regard to the N14 transport corridor; identification of the NLM as Priority Two investment area in the NWP Spatial Development Framework. Key Weaknesses include: municipal financial viability; growing unemployment; generally declining economy; lack of industrial development in Vryburg; infrastructural neglect and service backlogs; and lack of a proper Land Use Management System. Key Opportunities include: capitalizing on Vryburg’s status as Secondary Regional Centre and the NLM’s strategic location; local economic development (LED) opportunities linked to establishing Vryburg as regional beef beneficiation centre, tourism, and game farming. Key Threats include: increasing urbanization of rural part of NLM population; environmental degradation; high unemployment and poverty levels; large housing backlogs; lack of capital to provide and maintain services infrastructure.</p> <p>A summary of the 9 NLM Ward Plans indicates that key identified community needs are mainly linked to</p>

			<p>roads (1), housing (2), municipal services (3), security, and employment/ LED. The IDP notes that the NLM has been suffering from chronic water shortages since 2009; that the waste water treatment plant exceeds capacity by 40%, that many municipal roads are in a bad state; and that illegal dumping is a serious and widespread issue in the NLM.</p> <p>The IDP does not explicitly deal with renewable energy development, but identifies carbon-footprint reduction, including supporting alternative energies, as LED programmes for the NLM. The Local Economic Development (LED) Strategy is specifically aligned with National Priority Outcomes 4 (“decent employment through inclusive economic growth”); 5 (a skilled and capable economic work force to support an inclusive growth path”) and 7 (vibrant, equitable rural communities and food security for all).</p>
Naledi Spatial Development Framework (SDF)	Naledi Local Municipality	2007	<p>As noted in the 2012-2007 IDP, the most recent approved 2007 SDF is outdated, and lacks spatial guidance in the form of maps and spatial development plans. The SDF is currently under review, and in early Final stage. The NLM planner has indicated that the Vryburg urban edge is currently in the process of being demarcated, but that no urban-edge or land use related maps were available for the Vryburg area. The development of a municipal landfill site on the northern portion of Rosendal Farm west of the N18 was confirmed, but the planner was unable to provide specific details with regard to location.</p>

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

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

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

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

YES	NO
See estimates below	

The table below provides an estimate of the amount of solid waste that will be generated during the construction phase of the project.

Waste Type	Amount
Domestic waste (Food, food packaging)	4 loads x 200 litre drums per week
Packaging waste (Card boxes, plastic, wood, cable drums & steel)	1500 loads of 16m ³ for 6 months
Ferrous & non-ferrous metal scrap	70 ton
Construction debris and rubble	30 ton
Dead vegetation	100 ton
Lithium batteries, dry cell	1 ton
Fluorescent tubes, bulbs, transformer waste	3 ton
All Electrical wastes such as Cables, Insulation material	15 ton
Oil, oil sludge, lubricating oil	1 ton

Construction waste will most likely consist of concrete, scrap metal and general waste. The waste will be collected and stored in suitable receptacles to be collected by the Naledi Local Municipality. The waste will then be transported to the nearest registered landfill. If possible and feasible, all waste generated on site during the construction phase must be separated into glass, plastic, paper, metal and wood to be recycled.

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

The waste will be disposed of at the nearest registered Landfill Site such as Hoopstad, Vryburg, Wolmaranstad, Wesselsbron, Warrenton or Welkom.

Will the activity produce solid waste during its operational phase?

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

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

YES	NO
Not determined at this stage	

Sources of general waste will be waste food, packaging, paper, etc. General waste will be stored on the site and removed on a weekly basis. The waste will be taken to a registered landfill by the local municipality, as the site is located outside of the waste collection route. If possible and feasible, all waste generated on site during the operational phase must be separated into glass, plastic, paper, metal and wood to be recycled.

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

The waste will be disposed of at the nearest registered Landfill Site such as Hoopstad, Vryburg, Wolmaranstad, Wesselsbron, Warrenton or Welkom.

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

It will be removed by a licensed contractor to a registered landfill site, excepting such kinds of waste.

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

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? YES NO

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility? YES NO

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? YES NO

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

m ³	
<input type="checkbox"/> YES	<input type="checkbox"/> 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

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:

N/A

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

YES	NO
YES	NO

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

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

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

Solar energy facilities operate by converting solar energy into electricity. This process is characterised as a non-consumptive use of natural resources and consumes no fossil fuel for its operation. Solar power produces an insignificant quantity of greenhouse gases over its lifecycle compared to coal-fired power stations. During the construction phase minor dust impacts and exhaust emissions may occur, but will be kept to a minimum by implementing appropriate mitigation measures and will not exceed acceptable limits. The operational phase of the facility does not produce carbon dioxide or any other type of pollution.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?

YES	NO
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If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) 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?

Describe the noise in terms of type and level:

During the construction phase, noise will be generated by ramming the poles of the photovoltaic structure into the soil. Minimal noise will also result from moving vehicles and the operation of machinery. This is not regarded as a significant noise source/impact and will not constitute a “disturbing noise”. Construction will also be limited to working hours 7am – 6pm. During the operational phase there will be no noise generated.

13. WATER USE

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

Municipal	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water
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As indicated by DPS79 Solar Energy (RF) (Pty) Ltd. the estimated maximum amount of water required during construction is 200m³ per month during the 12 months of construction. The estimated maximum amount of water required during the facility’s 20 years of production is 3 000m³ per annum. The majority of this usage is for the cleaning of the solar panels. Since each

panel requires approximately 2 liters of water for cleaning, the total amount of 350 000 panels will require 700 000 liters per wash. It is estimated that the panels may only need to be washed twice per annum, but provision is made for quaternary cleaning (March, May, July, and September). This totals approximately 2,800,000 liters per annum for washing, and allows 200,000 liters per annum (or 548 liters per day) for toilet use, drinking water, etc.

The proposed site will cover an area of approximately 150 ha, which in effect means that a total amount of 11 250m³ of water may be abstracted from the ground water resource without applying for a Water Use License. This means that the water use will only need to be registered with the Department of Water and Sanitation to obtain a General Authorisation regarding the abstraction of ground water. However, a WULA has been lodged for other water uses pertaining to the Waterloo Solar Energy facility.

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

The provision of water by the Municipality may be considered as an alternative to groundwater should groundwater proof not to be feasible.

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:

200 m³ -250 m³ litres

Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?

YES **NO**

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

It has been determined that the site falls within the C32 quaternary drainage region, this drainage region falls under Zone C, which refers to the size of the property on which the General Authorisation is applicable. According to the Revision of General Authorisations in terms of Section 39 of the National Water Act of 1998 (Act No. 36 of 1998), Zone C indicates that 75m³ of water per hectare may be taken from these drainage regions per annum.

An application for a Water Use License with the Department of Water and Sanitation is in process, due to the fact that the proposed power line (see accompanying BAR) will cross two non-perennial streams and the already approved Waterloo Solar Energy Facility will develop within 500m of a wetland.

14. ENERGY EFFICIENCY

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

Electricity use will be limited, and will primarily be related to the lighting of the facility and domestic use like lighting for offices and the control room. Design measures such as the use of energy saving light bulbs would be considered by the developer. Furthermore, the design of the PV arrays takes the position of the optimum solar radiation into account in order to efficiently capture the solar energy.

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

The project itself is an alternative energy source.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

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

- 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 and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	North West Province
District Municipality	Dr Ruth Segomotsi Mompati District Municipality
Local Municipality	Naledi Local Municipality
Ward Number(s)	Ward 1
Farm name and number	Waterloo 992
Portion number	0
SG Code	TOIN0000000099200000

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:

The proposed site is currently zoned as Agricultural land with a “Special Consent” for electrical purpose (See Appendix J).

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**

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

The study area traverses gently undulating plains for the most part. The site consists of a gentle to no slope, varying between 1200 m and 1203 m above sea level across the proposed 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	<input type="checkbox"/>	2.4 Closed valley	<input type="checkbox"/>	2.7 Undulating plain / low hills	<input checked="" type="checkbox"/>
2.2 Plateau	<input type="checkbox"/>	2.5 Open valley	<input type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input type="checkbox"/>	2.6 Plain	<input type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>
2.10 At sea	<input type="checkbox"/>				

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
	YES	NO	YES	NO	YES	NO
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.

The EIA and the geotechnical investigation conducted in 2012 found that the site is subject to the presence of dolomite. The geotechnical study, recommended that a dolomitic stability investigation be conducted prior to construction. Mitigation measures are provided in the Environmental Management Programme (refer to Appendix F) to avoid the formation sinkholes and to limit the risks involved should a sinkhole develop.

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.

In terms of vegetation type the site falls within the Ghaap Plateau Vaalbosveld vegetation type, which is described by Mucina and Rutherford (2006) as ‘least threatened’. The area is characterised by flat plateau with a well developed shrub layer with *Tarchonanthus camphorates* and *Acacia karroo*. Much of the south-central part of this unit has remarkably low cover of *Acacia* species for an arid savanna and is dominated by non-thorny trees.

A relatively large (depression) wetland is located approximately 500m north of the proposed site.

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	YES	NO	UNSURE
Non-Perennial River	YES	NO	UNSURE
Permanent Wetland	YES	NO	UNSURE
Seasonal Wetland	YES	NO	UNSURE
Artificial Wetland	YES	NO	UNSURE
Estuarine / Lagoonal wetland	YES	NO	UNSURE

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

A relatively large (depression) wetland is located just outside of the 500m buffer north of the site.

In order to maintain their integrity and ecological functions, sufficient buffer areas, approximately 200m around these wetland bodies should be maintained in natural or semi-natural condition. Currently the state of these allocated buffer areas (A1/A2 ESAs) can be confirmed as semi-natural and are vital for the maintenance of the “depression wetlands” themselves (See Appendix D3 and D7). These wetlands play an important role in biodiversity, hydrological as well geohydrological functioning of the landscape. Most of these pans are non-perennial, containing surface water only after sufficient precipitation and normally only for a short period of time.

6. LAND USE CHARACTER OF SURROUNDING AREA

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

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station ^H
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential ^A	Church	Agriculture
Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant ^A	Nature conservation area
Medium industrial ^{AN}	Train station or shunting yard ^N	Mountain, koppie or ridge
Heavy industrial ^{AN}	Railway line ^N	Museum
Power station	Major road (4 lanes or more) ^N	Historical building
Office/consulting room	Airport ^N	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam ^A	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses - Power lines & PV facility

If any of the boxes marked with an “N” are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

If any of the boxes marked with an “An” are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

If any of the boxes marked with an “H” are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	YES	NO
Core area of a protected area?	YES	NO

Buffer area of a protected area?	YES	NO
Planned expansion area of an existing protected area?	YES	NO
Existing offset area associated with a previous Environmental Authorisation?	YES	NO
Buffer area of the SKA?	YES	NO

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

In terms of vegetation type the site falls within the Ghaap Plateau Vaalbosveld vegetation type, which is described by Mucina and Rutherford (2006) as 'least threatened'. The area is characterised by flat plateau with a well developed shrub layer with *Tarchonanthus camphorates* and *Acacia karroo*. Much of the south-central part of this unit has remarkably low cover of *Acacia* species for an arid savanna and is dominated by non-thorny trees. Some protected plant species (*Acacia erioloba*, *Brunsvigia radula* and *Aloe grandidentata*) do occur outside of the study area, although none were found at the study sites within the study area (See Appendix A for Locality, Land capability, Vegetation and Environmental Sensitivity Maps).

7. CULTURAL/HISTORICAL FEATURES

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

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

Special attention was given to the identification of possible cultural or heritage resources on site. The initial site investigation concluded that there are no obvious heritage resources located on the site earmarked for development. However, a Heritage Impact Assessment (HIA) has been conducted to ensure that there would be no impact on cultural or historical features as a result of the proposed development (refer to Appendix D1).

The earliest Iron Age settlers who moved into the North West Province region were Tswana-speakers such as the Tlhaping, Hurutshe, Fokeng, Kgatla and Rolong. In the region of the study area, it was mostly the booRapulana and booRatlou sections of the Rolong (Breutz 1959).

Many early travellers, hunters and missionaries (Burchell 1824, Campbell 1822, Smith 1834-1836 (Lye 1975), Moffat 1842 and Harris 1852) either passed through the area or close to it. Their writings leave us a tantalising description of what life was in these communities before large-scale interaction with white settlers took place. Some of the first whites to settle here were the missionaries Samuel Broadbent and Thomas Hodgson, who settled some distance to the east of what later became known as Wolmaransstad.

The HIA concluded that no sites, features or objects dating to the Stone Age, Iron Age nor Historical period were identified in the study area.

Will any building or structure older than 60 years be affected in any way?
 Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO
YES	NO

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

According to the 2015/16 Naledi Local Municipality's draft IDP the Naledi Local Municipality is situated in the Dr Ruth Segomotsi Mompati District of South Africa's North West Province. It covers an area of approximately 7 264km² and is divided into nine wards representing the interests of the communities of Vryburg, Kismet Park, Huhudi, Colridge, Dithakwaneng, Stella and Devondale.

Level of unemployment:

Dr Ruth Segomotsi Mompati has an unemployment of 29%. The unemployment number of the Naledi Local Municipality is increasing. According to the 2015/16 Naledi Local Municipality's draft IDP, Naledi Local Municipality has a 24% unemployment.

Economic profile of local municipality:

In terms of the income distribution of households, most of the growth has taken place in poor and middle income households, reflecting the increase in unemployment and poverty that had been the result of the negative growth that the city has experienced since 1996.

Growth of the game farming, hunting and eco-tourism industries are among the fastest growing economic sectors in the global economy and generate billions of rand for national and regional economies. The province has adopted Agriculture, Culture and Tourism as the sectors that serve as the key economic strategy of the province. The local municipality is strongly supportive of the growth of game farming, game trading and responsible hunting. It also realises the immense potential for the expansion of eco-tourism opportunities. The hunting and agricultural sectors are the single biggest contributors to employment in the local economy (27.8%).

Level of education:

The level of education in the area raised significantly with citizens with higher education almost doubling in amount from 2001 to 2011 (1860 to 3560 people). Grade 12 and secondary school level education in the municipality also increased significantly.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 1.1 – 1.9 Billion for the entire 150 hectare Waterloo Solar Energy Facility.	
What is the expected yearly income that will be generated by or as a result of the activity?	150-250mln ZAR p/a. Dependent on exchange rate, technology and tariff bid	
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 and construction phase of the activity/ies?	220 low-skilled and 120 semi-skilled 60 skilled over a period of 18-24 months.	
What is the expected value of the employment opportunities during the development and construction phase?	Construction phase: R74-98 Million over the 18-24 month period.	
What percentage of this will accrue to previously disadvantaged individuals?	55%	
How many permanent new employment opportunities will be created during the operational phase of the activity?	20 low-skilled, 5 semi-skilled and 3 skilled over a period of 20 years.	
What is the expected current value of the employment opportunities during the first 10 years?	2years construction R 98 Million and 8 years operation R 33.88 Million = R 131 880 000	
What percentage of this will accrue to previously disadvantaged individuals?	Construction: 26% Operation: 49%	

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix A to this report.

- a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	<p>The function of this area as a CBA is to provide a critical linkage and form a core corridor area between the upper dry Kalahari Bushveld and the lower lying Droë Hartsvrivy Valley. When taking into account the small size of the T1 CBA located within the proposed footprint area, the fractured nature of this area and the number of barriers isolating this section from the rest of the T1 CBA, including numerous fences, the provincial gravel road and the numerous smaller farm tracks and service roads traversing the area, the capabilities of this small portion of T1 CBA to contribute as an important linkage and corridor is considered to be extremely limited.</p>
				<p>These areas also fall within A2 CBAs Most of the T2 CBA within the farm portion falls within a landscape similar to that described for the T1 CBA, namely a semi-natural dry Bushveld, moderately disturbed, mainly due to overgrazing. Furthermore, the landscape is highly fractured by access roads, fencing and the larger provincial gravel road as well as the R34 Road. Having said this, the area still provides habitat for numerous smaller mammals as well as reptile species.</p>
				<p>A relatively large pan (depression) wetland classified as an A2 CBA is located just outside of the 500m buffer zone, north of the proposed site. This alleged non-perennial “depression wetlands” contributes not only to habitat and species diversity but also allegedly provides vital ecological functions (See Appendix D3 and D7). Therefore, buffer zones of 200m radius are proposed surrounding the wetland and deemed sufficient in order to minimize potential impacts.</p>

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
Natural	5%	Transformation has occurred due to grazing of the natural veld.
Near Natural (includes areas with low to moderate level of alien invasive plants)	85%	A high diversity of indigenous plant species and animal species appears to be present at the site proposed for development. The conservation importance of the study area can be described as moderate.
Degraded (includes areas heavily invaded by alien plants)	5%	Vegetation at the site is in fair condition, maybe somewhat disturbed in some areas.
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	5%	Roads and fencing are present on site.

c) Complete the table to indicate:

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems								
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline			
	Endangered									
	Vulnerable									
	Least Threatened	YES	NO	UNSURE	YES	NO	YES	NO		

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

Ecological habitat and landscape features

In terms of vegetation type the site falls within the Ghaap Plateau Vaalbosveld vegetation type, which is described by Mucina and Rutherford (2006) as 'least threatened'. The area is characterised by flat plateau with a well developed shrub layer with *Tarchonanthus camphorates* and *Acacia karroo*. Much of the south-central part of this unit has remarkably low cover of *Acacia* species for an arid savanna and is dominated by non-thorny trees.

A relatively large (depression) wetland is located in approximately 500 m from the proposed site. In order to maintain their integrity and ecological functions, sufficient buffer areas, approximately

200m around these wetland bodies should be maintained in natural or semi-natural condition. Currently the state of these allocated buffer areas (A1/A2 ESAs) can be confirmed as semi-natural and are vital for the maintenance of the “depression wetlands” themselves (See Appendix D3 and D7).

These wetlands play an important role in biodiversity, hydrological as well geohydrological functioning of the landscape. Most of these pans are non-perennial, containing surface water only after sufficient precipitation and normally only for a short period of time.

Avifaunal Study

It was determined that avifauna diversity in the area is high with approximately 332 avifauna species occurring in the region. Of these species 8 (6%) are listed as endemic and 26 (7%) are listed as being Red Data species. During the study, avifauna species diversity and abundance was low with only 39 species being detected during the site visit. Red Data species, which may occur in the study area, are discussed and listed in Appendix D2.

Although there may be considerable impact due to the clearing of vegetation and the large footprint required for commercial-scale energy production, which would refer to the habitat loss and disturbance created during the construction phase of the, birds are the most mobile of vertebrate species and there is considerable amount of the same vegetation in adjacent areas to which avifauna will move. Operational phase impacts include birds nesting on panels and power lines, which may cause electrocution of birds and collision with overhead power lines.

If the recommended mitigation measures are implemented, the construction phase impacts of the proposed development would be reduced to acceptable levels. There are a number of power lines in the vicinity as well as throughout the North West Province. Power lines that cross remote areas should be fitted with bird guards to reduce the incidence of perching on towers. With mitigation, it is considered unlikely that the addition of the proposed length of power line will significantly add to the cumulative impact of electrocution events in the region.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Stellalander	
Date published	10 February 2016	
Site notice position	Latitude	Longitude
	27° 01' 35,68" S	24° 46' 59,80" E
Date placed	10 February 2016	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 982.

The public participation process included the publishing of a notice regarding the proposed project in the local newspaper on 10 February 2016. Site notices were placed on site on 10 February 2016 and notification letters were distributed to identified I&APs on 12 February 2016. Affected and neighbouring landowners have been notified via registered post on 12 February 2016.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 982

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (Tel number or e-mail address)
Dr. Chris van Zyl Trust	Landowner	082 779 3974
E. A. L van der Merwe	Surrounding Landowner	P. O. Box 534 Vryburg 8600
Sedutla family trust	Surrounding Landowner	P. O. Box 127 Vryburg 8600
Mr. J. S. D. Webber	Surrounding Landowner	P. O. Box 291 Vryburg 8600
Waterloo ranches CC	Surrounding Landowner	P. O. Box 117 Vryburg 8600
Ds. Martin Jordaan	Vryburg Rate Payers Association	PO Box 2972 Vryburg 8600

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;

- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

Proof that the key stakeholders received written notification of the proposed project is included in **Appendix E2**.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

To date the following comments were received:

Summary of main issues raised by I&APs	Summary of response from EAP
In an email dated 8 December 2015, John Geeringh, from Eskom GC: Land Development asked to be kept informed on the project via email.	No response
Mr. K.P. Motsoaledi stated in an email dated January 2016 that PRASA is in support of the project which will benefit the public.	No response
In an email dated 25 February 2016, Mr. Khutjo Sekwaila from the Department of Water and Sanitation noted with concern that the proposed activity may constitute a third water use licence for the same project. With that said, Mr. Sekwaila stated that the department requested a site inspection as well as a formal meeting.	In an email dated 7 March 2016, the EAP thanked Mr. Sekwaila for his response and explained that the initial EIA was conducted in 2012 and was granted an EA. The EAP then explained how this EIA relates to the first project. Concluding that by the EAP's understanding the new proposed activity will require a water use licence application for the abstraction of ground water. The EAP requested a meeting on the 15 th or 16 th of March 2016. No response was received.

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR 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 the Final BAR as Appendix E3.

Comments received are included in the Comments and Response Report contained in **Appendix E3**.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Organization	Contact person	Postal address	E-mail address	Contact details	Date submitted	Date feedback received
Land Owner – Regulation 54(2)(b)(i)						
Chris van Zyl Trust	Mr. Chris van Zyl	PO Box 1801 Vryburg 8600	waterloo1@telcomsa.net vanzylcg@gmail.com	082 779 3974	2 December 2015	No feedback received
The Municipality in which jurisdiction the development is located – Regulation 54(2)(b)(v)						
Naledi Local Municipality	Municipal Manager: Mr Modisenyane Segapo	PO Box 35 Vryburg 8600	info@naledi.local.gov.za	053 928 2200 (t) 053 927 3482 (f)	2 December 2015	No feedback received
Municipal councilor of the ward in which the site is located – Regulation 54(2)(b)(iv)						
Naledi Local Municipality	Councilor: Mr. Kagiso Palangangwe	PO. Box 35 Vryburg 8600		053 928 2200 (t) 053 297 3482 (f)	2 December 2015	No feedback received
Organs of state having jurisdiction – Regulation 54(2)(b)(vi)						
NW Department of Economic Development, Environment, Conservation and Tourism	Ms.Skosana & Ms. Mosadi	Private Bag X2039 Mmabatho 2735	oskosana@nwpg.gov.za mosadim@nwpg.gov.za	018 389 5156 (t) 082 748 1180 (Cell)	2 December 2015	No feedback received
Department of Water Affairs and Forestry	Mr. Abe Abrahams Mr. Khutjo Sekwaila	Private Bag X6101 Kimberley 8300	abrahamsa@dwa.gov.za & mazwir@dwa.gov.za & sekwailak@dws.gov.za	051 405 9000 (t) 051 448 1115 (f) 053 836 7600 (t) 053 830 8825 (f)	2 December 2015	8 December 2015
Department of	Ms. Mashudu	Private Bag X120	MashuduMa@daff.gov.za	012 319 7634 (t)	2 December	No feedback

Agriculture	Marubini	Pretoria 0001		012 319 7619 (f)	2015	received
Department of Energy	Director General: Ms. Nelly Magubane	Private Bag X19 Arcadia 0007	kate.modise@energy.gov.za	012 444 4256 (t) 086 581 8505 (f)	2 December 2015	No feedback received
Department of Mineral Resources	Mr. Pieter Swart	Private Bag A1 Klerksdorp 2570	Pieter.swart@dmr.gov.za	018 487 4300 (t)	2 December 2015	No feedback received
South African Heritage Resources Agency (SAHRA)	Mr. Phillip Hine & Ms. Mariagrazia Galimberti	PO Box 4637 Cape Town 8000	phine@sahra.org.za mgalimberti@sahra.org.za	021 462 4502 (t) 021 462 4509 (f)	2 December 2015	No feedback received
North West Provincial Heritage Authority (PHRA)	Mr. Mosiane	Private Bag X90 Mmabatho 2735	mosianem@nwpg.gov.za	018 388 2826 (t) 086 621 1240 (f)	2 December 2015	No feedback received
Department of Transport	HOD: Ms. Mulangaphuma	Private Bag X2080 Mmabatho 2735	MulangaL@dot.gov.za	012 309 3000 (t) 012 328 3194	2 December 2015	No feedback received
Department of Communications	Mr. Claude Nadasen	-	claudio@doc.gov.za / Pta@live.co.za	012 427 8161 (t) 012 362 6915 (f) 082 376 7164 (c)	2 December 2015	No feedback received
Department of Rural, Environmental and Agricultural Development, North West	Mr. Steven Mukhola	Private Bag X804 Potchefstroom 2520	mmabula@nwpg.gov.za	018 299 6710 (t) 086 632 6930 (f)	2 December 2015	No feedback received
Other– Regulation 54(2)(b)(vii)						
Dr Ruth	Municipal	PO Box 21,	keoagileo@bophirima.co.za	053 928 4700 (t)	2 December	No feedback

Segomotsi Mompoti District Municipality	Manager: Mr. Zebo Tshetlho	Vryburg, 8600		053 927 0858 (t) 053 927 2401 (f)	2015	received
Vryburg Rate Payers Association	Ds. Martin Joraan	PO Box 2972 Vryburg 8600		053 927 3404 (t) 082 320 4892 (Cell)	2 December 2015	
ESKOM	Ms. Katlego Motlha, Mr. Muller, Mr. Leask, Mr. Marais, Mr. Masimola & Mr. Motitswe	PO Box 356 Westdene Bloemfontein 9300	MotlhaKN@eskom.co.za MullerV@eskom.co.za; kevin.leask@eskom.co.za; Ronald.marais@eskom.co.za; masemola@eskom.co.za; hope.masango@eskom.co.za	-	2 December 2015	No feedback received
NERSA	Ms. Andile Gxasheka	PO Box 40343, Arcadia, 0007	andile.gxasheka@nersa.org.za nokuthula.nkosi@nersa.org.za	012 401 4775 (t) 012 401 4700 (f)	2 December 2015	No feedback received
PRASA	Mr. Tony Games	Private Bag X101 Braamfontein 2017	gmbongwe@prasa.com tgames@prasa.com	011 773 1506 (t) 083 268 7129 (C)	2 December 2015	8 December 2015
SANRAL	Ms. Tiyiselani Mashele	Private Bag X17 Lynwood Ridge Pretoria 0040	mashelet@nra.co.za	012 844 8000 (t) 012 844 8200 (f)	2 December 2015	No feedback received
WESSA	Mr. Lemson Petha	PO Box 435, Ferdale, 2160	morgan.griffiths@wessa.co.za	011 462 5663 (t)	2 December 2015	No feedback received
Transnet	Keabetsoe Dlamini		Keabetsoe.Dlamini@transnet.net	011 308 3000 (t) 011 308 2638 (f)	2 December 2015	8 December 2015
Civil Aviation Authority	Mr. Chris Isherwood	Private Bag X73 Halfway House 1685	isherwoodC@caa.co.za	011 545 1028 (t) 011 545 1282 (f)	2 December 2015	No feedback received
SENTECH	-	Private Bag X06 Honeydew	support@sentech.co.za	0860 736 832 (t) 086 743 4411 (f)	2 December 2015	No feedback received

		2040				
Eskom GC: Land Development	John Geeringh	P O Box 1091 Johannesburg 2000	GeerinJH@eskom.co.za	011 516 7233 (t) 086 661 4064 (f) 083 632 7663 (c)	2 December 2015	8 December 2015
Surrounding Land Owners - Regulation 54(2)(b)(iii)						
Surrounding Landowner	E. A. L van der Merwe	P. O. Box 534 Vryburg 8600	-	-	2 December 2015	No feedback received
Surrounding Landowner	Sedutla family trust	P. O. Box 127 Vryburg 8600	-	-	2 December 2015	No feedback received
Surrounding Landowner	Mr. J. S. D. Webber	P. O. Box 291 Vryburg 8600	-	-	2 December 2015	No feedback received
Surrounding Landowner	Waterloo ranches CC	P. O. Box 117 Vryburg 8600	waterloo1@telcomsa.net vanzylcg@gmail.com	-	2 December 2015	No feedback received

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

Proof that the Authorities and Organs of State received written notification of the proposed project is included in Appendix E2.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. CONSULTATION WITH OTHER STAKEHOLDERS

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

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs is included as **Appendix E5**.

Copies of all correspondence and minutes of any meetings held are included in **Appendix E6**.

Public Meeting included in **Appendix E7**.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014 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. 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

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts 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. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

A summary and anticipated significance of the potential direct, indirect and cumulative impacts that may likely occur as a result of the construction, operational and decommissioning phase of the Waterloo Solar Energy Facility is provided below.

Preferred Site: Impact Assessment

For ease of reference the significance of the impacts is colour-coded as follow:

Low significance	Medium significance	High significance	Positive impact
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Activity	Impact summary	Significance after mitigation	Proposed mitigation
CONSTRUCTION PHASE			
<p><u>Site clearing and preparation</u> Certain areas of the site will need to be cleared of vegetation and some areas may need to be levelled.</p> <p><u>Civil works</u> The main civil works are:</p> <ul style="list-style-type: none"> • Terrain levelling if necessary– Levelling will be minimal as the potential site chosen is relatively flat. • Laying foundation- The structures will be connected to the ground through cement pillars, cement slabs or metal screws. The exact method will depend on the detailed geotechnical analysis. • Construction of access and inside roads/paths – existing paths will be used where reasonably possible. Additionally, the turning circle for trucks will also be taken into consideration. • Trenching – all Direct Current (DC) and Alternating Current (AC) wiring within the PV plant will be buried underground. Trenches will have a river sand base, space for pipes, backfill of sifted soil and soft sand and concrete layer where vehicles will pass. <p><u>Transportation and installation of PV panels into an Array</u> The panels are assembled at the supplier’s premises and will be transported from the factory to the site on trucks. The panels will be mounted on metal structures which are fixed into the ground either through a concrete foundation or a deep seated screw.</p>	<p>Direct impacts:</p> <ul style="list-style-type: none"> ▪ Loss or fragmentation of indigenous natural fauna and flora. 	Medium	<ul style="list-style-type: none"> ▪ If the development is approved, contractors must ensure that no animal species are disturbed, trapped, hunted or killed. ▪ The site should be fenced off prior to commencement of construction activities. ▪ The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be confined to the fenced off area and minimised where possible. ▪ An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase. ▪ All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase. ▪ The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. ▪ The implementation of the Rehabilitation Programme should be monitored by the ECO. ▪ Keep the area cleared to a minimum and careful removal and replanting of plants and trees of conservation importance. ▪ Seed collection, propagation and re-planting of saplings to make up for lost species should also be applied. ▪ A nursery should be started as a community project. The impact of vegetation clearing is likely to be a long term impact, but through careful planning and rehabilitation can be greatly reduced.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> • None 	N/A	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ A number of Solar Energy Plants are being proposed in the vicinity of Vryburg as well as throughout the province. 	Medium	
	<p>Direct impacts:</p> <ul style="list-style-type: none"> • Effects on local migration. 	Low	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
<p><u>Wiring to the Central Inverters</u> Sections of the PV array would be wired to central inverters which have a maximum rated power of 2000kW each. The inverter is a pulse width mode inverter that converts DC electricity to alternating electricity (AC) at grid frequency.</p>	<p>Indirect impacts:</p> <ul style="list-style-type: none"> • None 	<p>N/A</p>	<p>traffic can be maintained free of tracked soil or fill materials. Mitigation: The effects on local migrations can be mitigated in the following ways.</p> <ul style="list-style-type: none"> • The construction area can be isolated by means of a chain link fence in order to prevent animals on local migrations entering the area and being killed. • The effect of roads on local migrations can be mitigated by the installation of culverts at regular intervals along the roads and the installation of drift fences towards the culverts, although these methods may not eliminate the mortalities among migrating animals, they should greatly reduce the number of animals killed on haul roads. • A low speed limit can be strictly enforced in order to reduce collisions with animals on the roads.
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • None with mitigation. 	<p>N/A</p>	
	<p>Direct impacts:</p> <ul style="list-style-type: none"> ▪ Loss or fragmentation of habitats. 	<p>Low</p>	<ul style="list-style-type: none"> • The footprint of construction related activities should be limited to the site and minimised where possible. • Trees and scrubs earmarked for removal should be examined for active nests by a knowledgeable person as soon as the project is approved. If no nests are found, the plants should be removed immediately, even if clearance of the area is scheduled for a later date. If this proactive approach is followed, it will prevent birds from nesting in the trees/scrubs later, and if any active nests are found it will allow sufficient time for the birds to complete their breeding cycle before the plants must eventually be removed. • If the development is approved, establishment of exotic and invasive plant species should be avoided and where these have been found at the site continuous eradication should take place. The EMPr also provides numerous mitigation measures related to flora– refer Appendix G.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> • None. 	<p>N/A</p>	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Considering that the site is located in a CBA and that a numerous PV Solar Facilities are being proposed in the area, the power line may have a medium negative cumulative impact. 	<p>Medium</p>	
	<p>Direct impacts:</p> <ul style="list-style-type: none"> ▪ Disturbance of soils and existing land use (soil compaction). 	<p>Low</p>	
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> • None 	<p>N/A</p>	<ul style="list-style-type: none"> ▪ The most effective mitigation will be the minimisation of the project footprint by using the existing roads in the area and not create new roads to prevent other areas also getting compacted.
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ Should these impacts occur, there may 	<p>Low</p>	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	be a cumulative impact on storm water runoff in the study area.		
	Direct impacts: <ul style="list-style-type: none"> ▪ Spillage of harmful or toxic substances. 	Low	<ul style="list-style-type: none"> • The spillage of harmful or toxic substances can be mitigated by the implementation of a sound emergency spillage containment plan, which can be implemented as soon as a spill of harmful or toxic substances occurs.
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	
	Cumulative impacts: <ul style="list-style-type: none"> • None with mitigation. 	N/A	
	Direct impacts: <ul style="list-style-type: none"> • Impact on local bird communities due to disturbance. 	Low	
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> • Contractors need to minimise the amount of disturbance during the construction phase of the facility, by staying within the demarcated construction area. • If the nest of a large species is detected within the vicinity of the area to be disturbed, then the North West Department needs to be notified and all attempts made to minimise the amount of disturbance near it. • An avifauna monitoring program is advised.
	Cumulative impacts: <ul style="list-style-type: none"> • Development of multiple solar energy facilities in this region near Vryburg may have cumulative impacts on birds, however limited due to the species which occur in the area. 	Low	
	Direct impacts: <ul style="list-style-type: none"> • Collision of birds with infrastructure and electrocution with the development. 	Low	
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> • Where possible, avoid clearing vegetation in drainage channels or washes, where bird density and diversity has the potential to be higher (although this higher diversity was not recorded during the site visit). • If possible, the servitude of the power line exiting the site should follow existing roads and not cut across habitat. • All construction and maintenance activities must be undertaken in accordance with Eskom’s Environmental Best Practise Standards.

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	Cumulative impacts: <ul style="list-style-type: none"> • With mitigation, it is considered unlikely that the addition of the proposed length of power line will significantly add to the cumulative impact of electrocution events in the region. 	Low	<ul style="list-style-type: none"> • The construction footprint and access roads should be restricted to within the development footprint. • All social weavers nests that may be affected by the development must be moved by a qualified contractor or with the assistance of the relevant qualified persons; other bird nests in trees/higher shrubs need to be monitored and only removed if not used for breeding.
	Direct impacts: <ul style="list-style-type: none"> ▪ Increased erosion. 	Low	<ul style="list-style-type: none"> • An erosion monitoring and mitigation plan should be put in place.
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	
	Cumulative impacts: <ul style="list-style-type: none"> ▪ Negligible cumulative impact. 	N/A	
	Direct impacts: <ul style="list-style-type: none"> ▪ Impacts on the site’s hydrology. 	Low	
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> • New stormwater construction must be developed strictly according to specifications from engineers in order to ensure efficiency. • Any hazardous substances must be stored at least 30m from any of the water bodies on site.
	Cumulative impacts: <ul style="list-style-type: none"> ▪ Should these impacts occur, there may be a cumulative impact on the hydrology of the area. 	Low	
	Direct impacts: <ul style="list-style-type: none"> ▪ Temporary vibration and noise disturbance. 	Low	
	Indirect impacts:	N/A	<ul style="list-style-type: none"> ▪ During construction care should be taken to ensure that noise from construction vehicles and plant equipment does not intrude on the surrounding residential areas. ▪ Plant equipment such as generators, compressors, concrete mixers as well as vehicles should be kept in good operating order and where appropriate have effective

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	<ul style="list-style-type: none"> • None. 		<ul style="list-style-type: none"> ▪ exhaust mufflers. ▪ Vibration and noise from heavy machinery can be kept to a minimum by reducing the movement of heavy vehicles to a minimum necessary for operations. Placing the vehicle yard as close to the construction area as possible will also reduce the scale of impact of vibration.
	Cumulative impacts: <ul style="list-style-type: none"> ▪ Negligible to no cumulative effects. 	N/A	
	Direct impacts: <ul style="list-style-type: none"> ▪ Generation of waste - general waste, construction waste, sewage and grey water. 	Low	<ul style="list-style-type: none"> ▪ All waste generated on site should be stored in waste bins and removed from site on a regular basis. ▪ Remove waste to a licensed landfill site. ▪ If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood to be recycled.
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	
	Cumulative impacts: <ul style="list-style-type: none"> ▪ Additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community. 	Medium	
	Direct impacts: <ul style="list-style-type: none"> ▪ Impacts on heritage resources. 	N/A	
	Indirect impacts: <ul style="list-style-type: none"> ▪ None. 	N/A	<ul style="list-style-type: none"> • If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. Also refer to the mitigation measures provided in the EMPR – Appendix G.
	Cumulative impacts: <ul style="list-style-type: none"> ▪ Should these impacts occur, there may be a cumulative impact on the preservation of heritage objects in the area. 	N/A	
Direct impacts:	Medium	In order to enhance local employment and business	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	<ul style="list-style-type: none"> ▪ Temporary employment and other economic benefits (business opportunities and skills development). 		<p>opportunities associated with the construction phase the following measures should be implemented:</p> <p><u>Employment</u></p>
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> ▪ Where reasonable and practical DPS79 Solar Energy (RF) (Pty) Ltd. should appoint local contractors and implement a ‘locals first’ policy, especially for semi and low-skilled job categories. Due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ The community will have an opportunity to better their social and economic well being, since they will have the opportunity to upgrade and improve skills levels in the area. 	Medium	<ul style="list-style-type: none"> ▪ Where feasible, efforts should be made to employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria. ▪ Before the construction phase commences, it is suggested that DPS79 Solar Energy (RF) (Pty) Ltd. should meet with representatives from the Naledi Local Municipality to establish the existence of a skills database for the area. If such as database exists it should be made available to the contractors appointed for the construction phase. ▪ It is suggested that the local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that DPS79 Solar Energy (RF) (Pty) Ltd. intends following for the construction phase of the project. ▪ Where feasible, a training and skills development programmes for local workers should be initiated prior to the initiation of the construction phase. ▪ The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. <p><u>Business</u></p> <ul style="list-style-type: none"> ▪ It is suggested that DPS79 Solar Energy (RF) (Pty) Ltd. should liaise with the Naledi Local Municipality with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g. construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender

Activity	Impact summary	Significance after mitigation	Proposed mitigation
			<p>process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work.</p> <ul style="list-style-type: none"> ▪ Where possible, DPS79 Solar Energy (RF) (Pty) Ltd. should assist local BBBEE companies to complete and submit the required tender forms and associated information. ▪ The Naledi Local Municipality, in conjunction with the local business sector and representatives from the local hospitality industry, should identify strategies aimed at maximising the potential benefits associated with the project.
	<p>Direct impacts:</p> <ul style="list-style-type: none"> ▪ Visual intrusion. 	Low	<ul style="list-style-type: none"> ▪ Dust suppression is important as dust will raise the visibility of the development. ▪ New road construction should be minimised and existing roads should be used where possible.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> ▪ The contractor should maintain good housekeeping on site to avoid litter and minimise waste.
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ The construction of the solar plant and associated infrastructure will increase the cumulative visual impact of industrial type infrastructure being proposed in the region. 	Medium	<ul style="list-style-type: none"> ▪ Although there are no readily erodible slopes on the site, erosion risks should be assessed and minimised as erosion scarring can create areas of strong visual contrast with the surrounding vegetation, which can often be seen from long distances since they will be exposed against the hill slopes. ▪ Mitigation of lighting impacts includes the pro-active design, planning and specification lighting for the facility by a lighting engineer. The correct specification and placement of lighting and light fixtures for the PV plant and the ancillary infrastructure will go far to contain rather than spread the light. ▪ Fires and fire hazards need to be managed appropriately. ▪ Screening should be implemented by erection of the security fence, and by retaining existing and <i>establishing ecologically appropriate additional vegetation</i>. The growth of vegetation will improve screening into the operational phase.
	<p>Direct impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> ▪ The contractor must ensure that damage caused by construction related traffic to the R34 Road is repaired before the completion of the construction phase. The costs associated with the repair must be borne by the contractor.
	<p>Indirect impacts:</p>	Low	<ul style="list-style-type: none"> ▪ Dust suppression measures must be implemented for

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	<ul style="list-style-type: none"> ▪ Increase in construction vehicles. <p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ If damage to roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage. 	Low	<ul style="list-style-type: none"> ▪ heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. ▪ All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.
	<p>Direct impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> ▪ Where reasonably and practicably possible DPS79 Solar Energy (RF) (Pty) Ltd. should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories. ▪ It is suggested that DPS79 Solar Energy (RF) (Pty) Ltd. should consider the need for establishing a Monitoring Forum (MF) in order to monitor the construction phase and the implementation of the recommended mitigation measures. The MF should be established before the construction phase commences, and should include key stakeholders, including representatives from the Naledi Local Municipality, farmers and the contractor(s). The MF should also be briefed on the potential risks to the local community and farm workers associated with construction workers. ▪ If the suggestions above is followed, it is suggested, DPS79 Solar Energy (RF) (Pty) Ltd. and the contractor(s) should, in consultation with representatives from the MF, develop a code of conduct for the construction phase. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be dismissed. All dismissals must comply with the South African labour legislation. ▪ It is suggested that DPS79 Solar Energy (RF) (Pty) Ltd. and the contractor should implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase. ▪ The construction area should be fenced off before construction commences and no workers should be permitted to leave the fenced off area. ▪ The contractor should provide transport to and from the
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> • Impact of construction workers on local communities. 	Low	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community. 	Medium	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
			<p>site on a daily basis for low and semi-skilled construction workers. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site.</p> <ul style="list-style-type: none"> ▪ Where necessary, the contractors should make the necessary arrangements to enable low and semi-skilled workers from outside the area to return home over weekends and/ or on a regular basis. This would reduce the risk posed to local family structures and social networks. ▪ It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.
	<p>Direct impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> ▪ Where reasonably and practicably possible, DPS79 Solar Energy (RF) (Pty) Ltd. should implement a “locals first” policy, specifically with regard to unskilled and low skilled opportunities. ▪ DPS79 Solar Energy (RF) (Pty) Ltd. should implement a policy that no employment will be available at the gate.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> ▪ Influx of job seekers. 	Low	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ Impacts on family and community relations that may, in some cases, persist for a long period of time. Also in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community. 	Medium	
	<p>Direct impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> ▪ It is suggested that, DPS79 Solar Energy (RF) (Pty) Ltd. should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for, should DPS79 Solar Energy (RF) (Pty) Ltd. act negligently. The agreement should be signed before the construction
	<p>Indirect impacts:</p>	Low	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	<ul style="list-style-type: none"> ▪ Risk to safety, livestock and farm infrastructure. <p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ Negligible cumulative effects, provided losses are compensated for. 	<p style="background-color: yellow;">N/A</p>	<p>phase commences.</p> <ul style="list-style-type: none"> ▪ The construction area should be fenced off prior to the commencement of the construction phase or as soon as possible after the commencement of the construction phase. The movement of construction workers on the site should be confined to the fenced off area. ▪ Contractors appointed by DPS79 Solar Energy (RF) (Pty) Ltd. should provide daily transport for low and semi-skilled workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties. ▪ DPS79 Solar Energy (RF) (Pty) Ltd. should consider the option of establishing a MF (see above) that includes local farmers and develop a Code of Conduct for construction workers. This committee should be established prior to commencement of the construction phase. The Code of Conduct should be signed by the proponent and the contractors before the contractors move onto site. ▪ DPS79 Solar Energy (RF) (Pty) Ltd. should hold contractors liable for compensating farmers in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below). ▪ Particular care should be taken with regards to plastic waste that poses a threat to livestock if ingested. ▪ Contractors appointed by DPS79 Solar Energy (RF) (Pty) Ltd. must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms. ▪ Contractors appointed by DPS79 Solar Energy (RF) (Pty) Ltd. must ensure that construction workers who are found guilty of trespassing, stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation. ▪ The housing of construction workers on the site should be

Activity	Impact summary	Significance after mitigation	Proposed mitigation
			strictly limited to security personnel.
	Direct impacts: <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> ▪ It is suggested that DPS79 Solar Energy (RF) (Pty) Ltd. should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for should DPS79 Solar Energy (RF) (Pty) Ltd. act negligently. The agreement should be signed before the construction phase commences. ▪ A fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase. ▪ Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas. ▪ Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months; ▪ Contractor to provide adequate fire fighting equipment on-site, including a fire fighting vehicle. ▪ Contractor to provide fire-fighting training to selected construction staff. ▪ No construction staff, with the exception of security staff, to be accommodated on site overnight. ▪ As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire fighting costs borne by farmers and local authorities.
	Indirect impacts: <ul style="list-style-type: none"> ▪ Increased risks of grass fires. 	Low	
	Cumulative impacts: <ul style="list-style-type: none"> ▪ Negligible cumulative effects, provided losses are compensated for. 	N/A	
OPERATIONAL PHASE			
The key components of the proposed project are described below: <u>PV Panel Array</u> - To produce 75MW, the proposed facility will require numerous linked cells placed behind a protective glass sheet to form a panel. Multiple panels	Direct impacts: <ul style="list-style-type: none"> ▪ Soil erosion. 	Low	<ul style="list-style-type: none"> ▪ To avoid soil erosion, it will be a good practice to design storm water canals into which the water from the panels can be channeled. These canals should reduce the speed of the water and allow the water to drain slowly onto the land. ▪ Another important measure is to avoid stripping land
	Indirect impacts:	N/A	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
<p>will be required to form the solar PV arrays which will comprise the PV facility. The PV panels will be tilted at a fixed northern angle in order to capture the most sun.</p> <p><u>Wiring to Central Inverters</u> - Sections of the PV array would be wired to central inverters sized from 500kW to 1MW. The inverter is a pulse width mode inverter that converts DC electricity to alternating current (AC) electricity at grid frequency.</p> <p><u>Connection to the grid</u> - Connecting the array to the electrical grid requires transformation of the voltage from 480V to 33,000V to 132,000V. The normal components and dimensions of a distribution rated electrical substation will be required. Output voltage from the inverter is 480V and this is fed into step up transformers to 132kV (via 33kV). A new substation will be required on the site to step the voltage up to 132kV, after which the power will be evacuated to the national grid. It is expected that generation from the facility will tie in with the Mookodi Substation.</p> <p>It is expected that electricity generated from the facility will tie in with the Mookodi- Substation. The transmission line will be constructed within 36m wide servitude and will traverse the farm Waterloo 992.</p> <p><u>Roads</u> – Ready access already exist from the regional road (R34). However an internal site road network to provide access to the solar field and associated infrastructure will be required. All site roads will require a width of approximately 4m. Drainage trenches along the side of the internal road network will be installed.</p> <p><u>Fencing</u> - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm.</p>	<ul style="list-style-type: none"> None. 		<ul style="list-style-type: none"> surfaces of existing vegetation by only allowing vehicles to travel on existing roads and not create new roads.
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> Should these impacts occur, there will be a cumulative impact on the air and water resources in the study area in terms of pollution. 	Medium	
	<p>Direct impacts:</p> <ul style="list-style-type: none"> Change in land use. 	Low	<ul style="list-style-type: none"> The proponent should investigate the option of establishing a Rehabilitation Fund to be used to rehabilitate the area once the proposed facility has been decommissioned. The fund should be funded by revenue generated during the operational phase of the project. The motivation for the establishment of a Rehabilitation Fund is based on the experience from the mining sector where many mines on closure have not set aside sufficient funds for closure and decommissioning.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> None. 	N/A	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> Overall loss of farmland could affect the livelihoods of the affected farmers, their families, and the workers on the farms and their families. However, disturbed areas can be rehabilitated. 	Low	
	<p>Direct impacts:</p> <ul style="list-style-type: none"> Increase in storm water runoff. 	Low	<ul style="list-style-type: none"> The storm water management plan must include the construction of appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> None. 	N/A	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> Should these impacts occur, there will be cumulative impacts on the wider area. 	Medium	<ul style="list-style-type: none"> Water saving devices will be implemented.
	<p>Direct impacts:</p> <ul style="list-style-type: none"> Increased consumption of water. 	Medium	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> ▪ Structures must be limited to a height of no more than 3.5m. ▪ Mitigation of lighting impacts includes the pro-active design, planning and specification lighting for the facility by a lighting engineer. Security lighting should make use of down-lights to minimise light spill, and motion detectors where possible so that lighting at night is minimised. Care should be taken with the layout of the security lights to prevent motorists on the R34 from being blinded by lights at the approach to Waterloo 992. ▪ Screening should be implemented by means of vegetation in conjunction with security fencing. Water used for washing solar panels can be channelled to support growth of screening vegetation. ▪ Waste has to be accommodated at a licensed landfill site. ▪ If possible and feasible, all waste generated on site during the operational phase must be separated into glass, plastic, paper, metal and wood to be recycled.
	Cumulative impacts: <ul style="list-style-type: none"> ▪ An additional demand on water sources could result in medium cumulative impacts with regards to the availability of water. 	Medium	
	Direct impacts: <ul style="list-style-type: none"> ▪ Visual intrusion. 	Low	
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	
	Cumulative impacts: <ul style="list-style-type: none"> ▪ The construction of the solar plant and associated infrastructure will increase the cumulative visual impact of industrial type infrastructure in the region. However, this is not yet relevant in light of relatively low level occurrence of such infrastructure. 	Medium	
	Direct impacts: <ul style="list-style-type: none"> ▪ Generation of waste. 	Low	
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	
	Cumulative impacts: <ul style="list-style-type: none"> ▪ An additional demand for landfill space could result in significant cumulative impacts with regards to the availability of landfill space. 	Medium	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	Direct impacts: <ul style="list-style-type: none"> ▪ Leakage of hazardous materials. 	Low	<ul style="list-style-type: none"> • An area for the storage of hazardous materials must be established that conforms to the relevant safety requirements and that provides for spillage prevention and containment. • Environmental awareness training for staff, concerning the prevention of accidental spillage of hazardous chemicals and oil. • Inventories should be made of all substances that are potentially hazardous to groundwater, which will be stored, used or transported over the sites. The risk of each substance to the groundwater should be considered. • All areas in which substances potentially hazardous to groundwater are stored, loaded, worked with or disposed of should be securely banded (impermeable floor and sides) to prevent accidental discharge to groundwater.
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	
	Cumulative impacts: <ul style="list-style-type: none"> ▪ The continued leakage of hazardous materials may impact soil and water quality in the area. 	Medium	
	Direct impacts: <ul style="list-style-type: none"> ▪ Permanent employment. 	Medium	<ul style="list-style-type: none"> ▪ It is suggested that DPS79 Solar Energy (RF) (Pty) Ltd. should implement a training and skills development programme for locals during the first 5 years of the operational phase. The aim of the programme should be to maximise the number of South African's and locals employed during the operational phase of the project; ▪ It is suggested that DPS79 Solar Energy (RF) (Pty) Ltd., in consultation with the Naledi Local municipality, should investigate the options for the establishment of a Community Development Trust.
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	
	Cumulative impacts: <ul style="list-style-type: none"> ▪ Creation of permanent employment and skills and development opportunities for members of the local community and creation of additional business and economic opportunities in the area. 	Medium	
	Direct impacts: <ul style="list-style-type: none"> ▪ Generation of additional electricity. 	Medium	<ul style="list-style-type: none"> ▪ No mitigation measure required.
	Indirect impacts: <ul style="list-style-type: none"> • None. 		
	Cumulative impacts:		

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	<ul style="list-style-type: none"> ▪ The evacuation of generated electricity into the Eskom grid will strengthen and stabilize the grid (especially in the local area). 		
	<p>Direct impacts:</p> <ul style="list-style-type: none"> ▪ Establishment of a Community Trust. 	Medium	<ul style="list-style-type: none"> ▪ The option of establishing a single, municipal level Community Trust should be investigated by the Naledi Local municipality in consultation with renewable energy companies that have identified sites in the Naledi Local municipality². ▪ The Naledi Local municipality should be consulted as to the structure and identification of potential trustees to sit on the Trust. The key departments in the Naledi Local municipality that should be consulted include the Municipal Managers Office, IDP Manager and LED Manager. ▪ Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the benefits for the community as a whole and not individuals within the community. These initiatives will align with DPS79 Solar Energy (RF) (Pty) Ltd.'s commitments as submitted in its Bid Response under the Department of Energy's Renewable Energy Independent Power Producer Procurement Programme; ▪ Strict financial management controls, including annual audits, should be instituted to manage the funds generated for the Community Trust from the plant.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ Promotion of social and economic development and improvement in the overall well-being of the community 	Medium	
	<p>Direct impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> • None required since the potential impacts are insignificant.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> ▪ Change in the sense of place. 	Low	

² DPS79 Solar Energy (RF) (Pty) Ltd has already as part of the REIPPP bid submission contemplated a Community Trust which will own 5% of the equity stake.

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ The construction of the solar plant and associated infrastructure will increase the cumulative change in the sense of place due to industrial type infrastructure being proposed in the region. However, this is not yet relevant in light of relatively low level occurrence of such infrastructure. 	Low	<ul style="list-style-type: none"> • None required since the potential impacts are insignificant.
	<p>Direct impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> ▪ Financial implications to tourism in the area. 	Low	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ Negligible cumulative impact. The proposed facility is one of two proposed located in the vicinity of Klerksdorp and Orkney in the Naledi Local municipality. Due to size and height of facilities the potential cumulative impact on the tourism potential of the area are not rated significant. 	N/A	
	<p>Direct impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> ▪ Development of infrastructure for the generation of clean, renewable energy. 	Medium	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change. 	Medium	<ul style="list-style-type: none"> • number of South African's employed during the operational phase of the project.
DECOMMISSIONING PHASE			
<p><u>Dismantlement of infrastructure</u> During the decommissioning phase the Solar Energy Facility and its associated infrastructure will be dismantled.</p> <p><u>Rehabilitation of biophysical environment</u> The biophysical environment will be rehabilitated.</p>	<p>Direct impacts:</p> <ul style="list-style-type: none"> • Visual intrusion 	Low	<ul style="list-style-type: none"> • Dust suppression will play an important role to minimise the visibility of dust. • Contractors must avoid using roads not relevant to the project. • Contractors should try using public roads not used that often by the residents of Vryburg. • Construction vehicles must limit travelling on surrounding roads and in Vryburg during peak hours when possible. • New road construction must be avoided if possible. • Good housekeeping should be implemented. • Proper rehabilitation of disturbed areas after construction. • Proper firefighting equipment should be available on site. Not only fire extinguishers but also equipment like a water truck which can store large amounts of water. • Partial screening is possible by adding indigenous flora.
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> ▪ None. 	N/A	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ The decommissioning of the facility may increase the cumulative visual impact together with farming activities, Eskom power infrastructure and the 15 proposed solar power facilities in the area. 	Medium	
	<p>Direct impacts:</p> <ul style="list-style-type: none"> ▪ Rehabilitation of the physical environment. 	Low	
	<p>Indirect impacts:</p> <ul style="list-style-type: none"> • None. 	N/A	
	<p>Cumulative impacts:</p> <ul style="list-style-type: none"> ▪ The impact would result in negligible to no cumulative effects. 	N/A	
<p>Direct impacts:</p> <ul style="list-style-type: none"> ▪ Generation of waste. 	Low		

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	Indirect impacts: <ul style="list-style-type: none"> • None. 	N/A	<ul style="list-style-type: none"> ▪ DPS79 Solar Energy (RF) (Pty) Ltd. should ensure that retrenchment packages are provided for all staff retrenched when the facility is decommissioned. ▪ All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning. ▪ DPS79 Solar Energy (RF) (Pty) Ltd. should investigate the option of establishing an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. The Trust Fund should be funded by a percentage of the revenue generated from the sale of energy to the national grid over the 20 year operational life of the facility. The rationale for the establishment of a Rehabilitation Trust Fund is linked to the experiences with the mining sector in South Africa and failure of many mining companies to allocate sufficient funds during the operational phase to cover the costs of rehabilitation and closure.
	Cumulative impacts: <ul style="list-style-type: none"> ▪ An additional demand on municipal services could result in significant cumulative impacts with regards to the availability of landfill space. 	Medium	
	Direct impacts: <ul style="list-style-type: none"> ▪ Loss of employment. 	Medium	
	Indirect impacts: <ul style="list-style-type: none"> ▪ None. 	N/A	
	Cumulative impacts: <ul style="list-style-type: none"> ▪ The impact would result in negligible to no cumulative effects. 	N/A	
	NO-GO OPTION		
<p>This is the option of not constructing the expansion of the Waterloo Solar Energy Facility. This option will result in limited or no impacts occurring on the environment. However, should the infrastructure not be constructed as proposed, this will result in the situation where the Waterloo Solar Energy Facility will not be able evacuate a</p>	Direct impacts: <ul style="list-style-type: none"> • Waterloo Solar Energy Facility will not be able evacuate a total of 75 MW of energy. 	Medium	<ul style="list-style-type: none"> • No mitigation measures available.

Activity	Impact summary	Significance after mitigation	Proposed mitigation
total of 75 MW of energy as their agreement with the Department of Energy. This is an undesirable option for the project as it will pose negative impacts on the solar energy facility development. In addition, it will result in a situation where the electricity that could have been generated from the authorised solar energy facility will be lost.	Indirect impacts: <ul style="list-style-type: none"> • Socio-economic impacts such as job losses and loss of economic opportunities. 	Low	
	Cumulative impacts: <ul style="list-style-type: none"> • None. 	N/A	

A complete impact assessment in terms of Regulation 19(3) of GN 983 is included as Appendix F.

2. 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 A (preferred alternative)

Based on the contents of the report the following key environmental issues were identified, which were addressed in this Basic Assessment report:

- Impacts during the construction phase:
 - Loss or fragmentation of indigenous natural fauna and flora (- Medium)
 - Impact of construction workers on local communities (- Medium for specific individuals who may be affected by STDs etc.)
 - Temporary employment opportunities (+ Medium)
- Impacts during the operational phase, which include:
 - Increased consumption of water (-Medium)
 - Provision of employment (+ Medium)
 - Generation of additional electricity (+ Medium)
 - The establishment of a community trust (+ Medium)
- Impacts during the decommissioning phase:
 - Visual intrusion (-Low)
 - Generation of waste (- Low)
 - Loss of employment (- Medium)

The provision of sustainable services delivery (-Medium) during all the cycles of the project also needs to be considered.

Alternative B

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Alternative C

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No-go alternative (compulsory)

This is the option of not constructing the expansion of the Waterloo Solar Energy Facility. This option will result in limited or no impacts occurring on the environment. However, should the infrastructure not be constructed as proposed, this will result in the situation where the Waterloo Solar Energy Facility will not be able evacuate a total of 75 MW of energy as their agreement with the Department of Energy. This is an undesirable option for the project as it will pose negative impacts on the solar energy facility development. In addition, it will result in a situation where the electricity that could have been generated from the authorised solar energy facility will be lost. This would result in negative impacts at a local, regional and national scale from a socio-economic perspective and is not considered desirable. The negative impacts of the no go alternative are considered to outweigh the positive impacts of this alternative. The no go option is therefore not preferred.

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

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).

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.

It is the opinion of the independent EAP that the proposed development will have a net positive impact for the area and will subsequently ensure the optimal utilisation of resources. All negative environmental impacts can further be effectively mitigated through the proposed mitigation measures. Based on the contents of the report it is proposed that an environmental authorisation be issued, which states (amongst other general conditions) that the expansion of the Waterloo Solar Energy Facility and associated infrastructure, Registration Division HP, North West be approved subject to the following conditions:

- Implementation of the proposed mitigation measures set out in the EMPr.
- Implementation of the proposed mitigation measures set out in the specialist studies.
- The proposed solar facility must comply with all relevant national environmental laws and regulations.
- All actions and task allocated in the EMP should not be neglected and a copy of the EMP should be made available onsite at all times.
- The Final EMP report must include details on the final disposal method for the waste water from cleaning the panels and any other waste water effluent.

Is an EMPr attached?

YES

NO

The EMPr must be attached as **Appendix G**.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as **Appendix H**.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in **Appendix I**.

Any other information relevant to this application and not previously included must be attached in **Appendix J**.

NAME OF EAP

SIGNATURE OF EAP

DATE

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