



**ENVIRONMENTAL IMPACT ASSESSMENT FOR ACWA  
POWER SOLARRESERVE REDSTONE PHOTOVOLTAIC  
POWER PROJECT ON THE REMAINING EXTENT OF THE  
FARM NO. 469 NEAR POSTMASBURG, NORTHERN CAPE  
PROVINCE**

**BASIC ASSESSMENT SUBMITTED AS ADDENDUM TO THE SOCIO-  
ECONOMIC IMPACT ASSESSMENT**

**APRIL 2018**



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## Celebrate **Development Diversity**.



**Version:**

Draft version 1

April 2018

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Brief profile: Elena Broughton is a senior professional and the manager of the Innovation & Sustainable Development Unit at Urban-Econ. She has extensive knowledge in various fields of economic development that includes 14 years of experience in undertaking socio-economic impact assessment studies for a variety of private clients spanning the mining, manufacturing, energy, infrastructure, and retail sectors. She also acted as a peer reviewer in a number of socio-economic impact assessment studies and completed a few strategic socio-economic impact assessments. Her involvement in the field allowed her to develop a sound understanding of the South African environmental legislation and developmental policies and equipped her with a widespread knowledge of socio-economic implications and benefits of various new developments.

## TABLE OF CONTENTS

<b>SPECIALISTS DETAILS</b> .....	<b>3</b>
<b>TABLE OF CONTENTS</b> .....	<b>4</b>
<b>ACRONYMS AND ABBREVIATIONS</b> .....	<b>5</b>
<b>1 INTRODUCTION</b> .....	<b>6</b>
1.1 Scope of the Study .....	6
1.2 Project description .....	6
1.3 Location alternatives.....	7
1.4 Methodology .....	7
1.5 Assumptions and implications.....	8
<b>2 IDENTIFICATION OF POTENTIAL SOCIO-ECONOMIC IMPACTS</b> .....	<b>10</b>
2.1 Identification of potential direct and indirect socio-economic impacts.....	10
2.2 Identification of potential cumulative socio-economic impacts.....	12
<b>3 ASSESSMENT OF POTENTIAL SOCIO-ECONOMIC IMPACTS</b> .....	<b>12</b>
<b>4 IMPACT STATEMENT</b> .....	<b>15</b>
<b>ANNEXURE A: IMPACT ASSESSMENT RATING METHODOLOGY</b> .....	<b>18</b>
<b>REFERENCES</b> .....	<b>20</b>

## ACRONYMS AND ABBREVIATIONS

EIA	Environmental Impact Assessment
PV	Photovoltaic
NEMA	National Environmental Management Act
DEA	Department of Environmental Affairs
GDP	Gross Domestic Product

## 1 INTRODUCTION

This document is prepared by Urban-Econ Development Economists in response to the request by ACWA Power SolarReserve Redstone Solar Thermal Power Plant RF (Pty) Ltd (the “**Applicant**”) to provide an addendum to the Socio-Economic Impact Assessment Study undertaken for the ACWA SolarReserve Redstone Solar Thermal Power Plant RF (Pty) Ltd (the “**Redstone CSP Project**”) back in 2011 to incorporate the installation of a photovoltaic power project with a generation capacity of up to 20 MW on the Remaining Extent of Farm 469 near Postmasburg, the Northern Cape Province (the “**PV Power Project**”). The addendum is prepared in line with the Basic Assessment requirements in terms of Listed Activity Schedules 1 and 3 of the 2014 Environmental Impact Assessment (EIA) Regulations as amended.

### 1.1 Scope of the Study

The purpose of the socio-economic basic assessment is to assess the PV Power Project from a policy alignment and socio-economic impact perspectives, motivate the need and desirability of the project from a socio-economic development perspective, identify possible mitigation measures that could be employed to address negative effects identified, and assess the suitability of the proposed Project Site.

Considering that the PV Power Project will be established within the boundaries of the greater Project Site that has already been investigated and has received an environmental authorisation (EA) (DEA Ref.: 12/12/20/2316 AM7), the scope of work for the basic assessment focusing on the PV Power Project will be amended to include the following aspects, as advised by the environmental authorities during the engagement with the Applicant:

- A description and scope of the proposed PV Power Project
- Assessment of the potential positive and negative direct, secondary and cumulative effects of the PV Power Project
- Rating of the impacts in line with the methodology provided in Annexure A
- Proposed mitigation measures to address negative effects or enhance positive impacts
- An impact statement and recommendation of the preferred site alternative

### 1.2 Project description

The proposed Solar PV Power Project is located in the Tsantsabane Local Municipality, which forms part of ZF Mgcawu District in the Northern Cape Province. It is envisaged to be located approximately 30 km east of the town Postmasburg on the same property, Remaining Extent of the Farm No. 469, Hay District, as that of the authorised for Redstone CSP Project<sup>1</sup>.

The proposed solar PV Power Project will have a generation capacity of up to 20 MW and will make use of fixed or tracking crystalline solar PV modules, which will reach a height of three to five meters above ground. The proposed PV Power Project will also include power blocks comprising of inverters and transformers, as well as solar storage units that would provide for up to 30 MW-hours of storage. All laydown area and auxiliary facilities will be shared with those already approved for Redstone CSP

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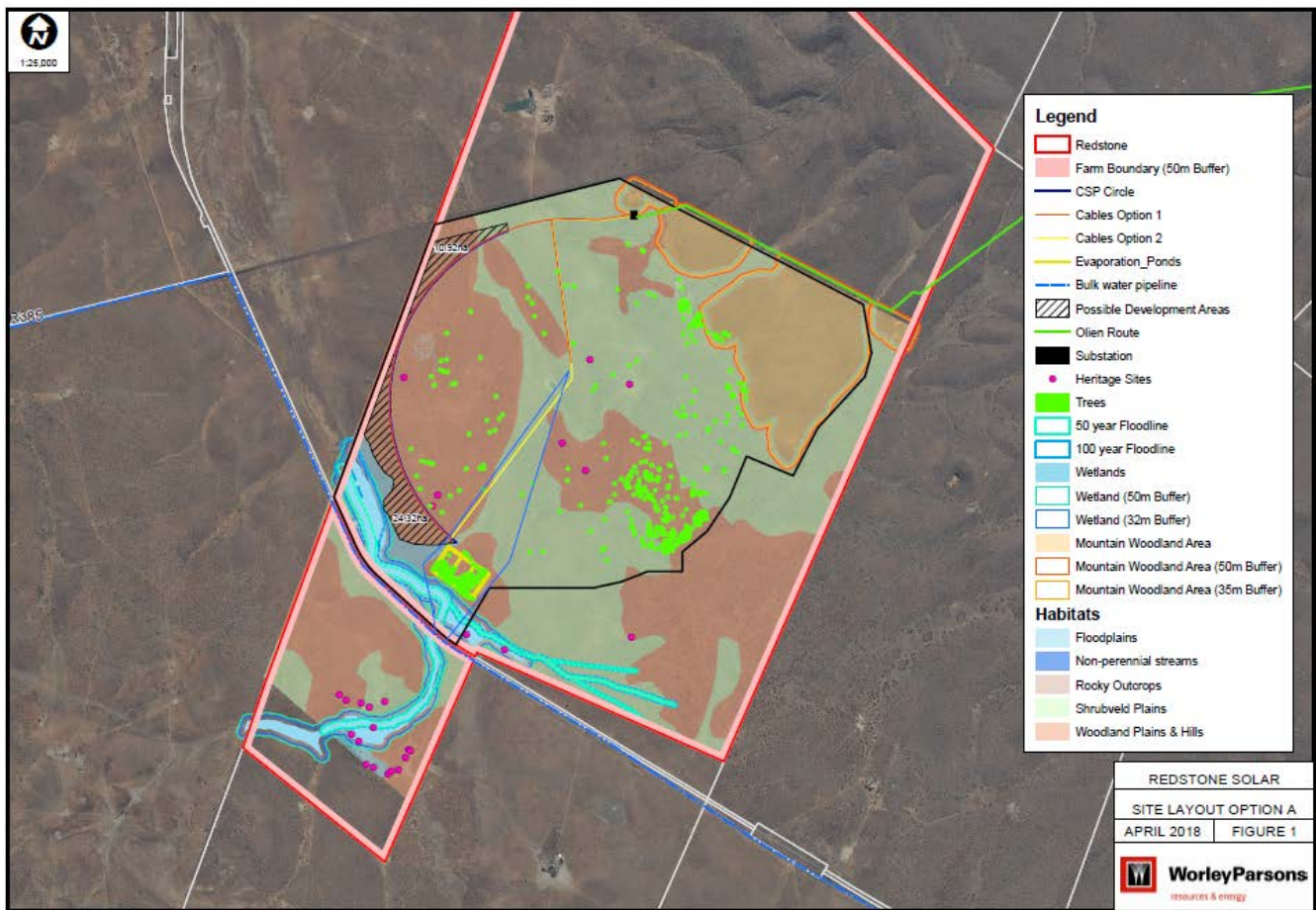
<sup>1</sup> The project was authorised under the National Environmental Management Act 107 of 1998 (NEMA) by the Department of Environmental Affairs (DEA) Ref. Nr 12/12/20/2316 (AM7)

Project. Considering the size of the project, less than 20 hectares of surface area will be utilised for the facility, all to be located within the Remaining Extent of the Farm No. 469, Hay District.

### 1.3 Location alternatives

Two possible location alternatives are considered for the proposed PV Power Project:

- Location 1: to the west of the heliostat field of the authorised Redstone CSP Project delineated as “possible development area” in the map below, and
- Location 2: scattered throughout the heliostat field and within the ring road, subject to the engineering assessment



Map 1: Location of the proposed PV Power Project

### 1.4 Methodology

The methodology employed in conducting the study comprised of the following steps:

- Review of the socio-economic study completed for the Redstone CSP Project back in 2011 and specifically the negative and positive impacts identified and analysed during the 2011 study
- Assessment of the relevance of the socio-economic impacts identified for Redstone CSP Project with respect to the proposed development and compile a list of socio-economic impacts that are required to be evaluated in the context of the current basic assessment

- Assessment of the identified impacts in line with the rating methodology included in Annexure A and formulation of mitigation measures, where applicable
- Comparison of the two site alternatives from each impact perspective, if applicable
- Provision of an impact statement

## 1.5 Assumptions and implications

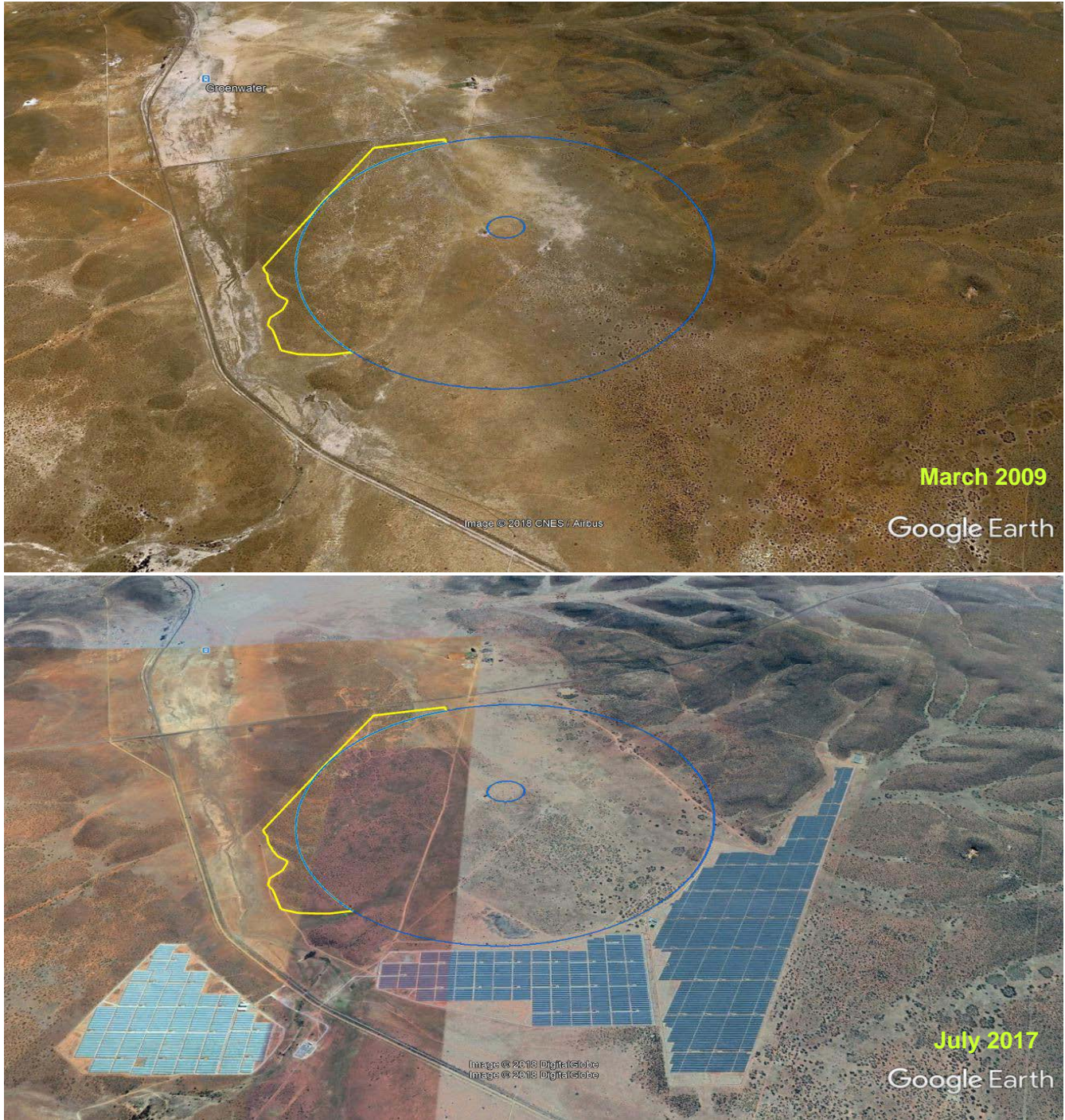
Considering the nature of this addendum, the following assumptions and limitations apply for this study:

- Project-related information supplied by the client for the purpose of the analysis is assumed to be reasonably accurate.
- Where necessary and applicable, the recent socio-economic data was utilised in the assessment derived from Quantec database. Otherwise, the socio-economic baseline developed during the Redstone CSP Project socio-economic impact assessment study assumed to be still relevant.
- A google site imagery for March 2009 (no historical imagery available for 2011) and July 2017 presented below shows that the land where the proposed facility is to be located and the area surrounding it has not changed from a land use perspective except for the development of the Lesedi and Jasper Solar PV Power Plants to the south, south-east and south-west of the project site. Importantly, no changes to the land use can be observed in the area where the proposed PV Power Project's footprint may be located or to the west of the possible project's footprint. This suggests that the socio-economic activities on the site and the immediate areas surrounding the site have not changed over the past seven years. Therefore, it was assumed that the socio-economic characteristics of the immediate receiving environment remained the same as what was observed during the 2011 study.
- The proposed Solar PV Power Project is expected to be smaller than the above-mentioned Redstone CSP Project in terms of:
  - Value of the development, including investment, employment, presence of construction workers on site, and household benefits
  - Footprint of the development
  - Height (and as a result visual effect) of the development
  - Construction phase and decommissioning phase duration of the development

Further to be above, the development and operation of the proposed Solar PV Power Project will coincide with the Redstone CSP Project, which means that many of the resources involved in construction and operation of the two power plants will be shared. On this basis, the following implications were assumed to be relevant:

- The socio-economic impacts for the proposed Solar PV Power Project would be of similar type and nature as those assessed in 2011; while no additional or new impacts to those identified in 2011 study can be expected – given that the socio-economic environment remained unchanged (and no new sensitive receptors are identified) and that the facility is considerably smaller than that analysed back in 2011 - some socio-economic impacts analysed in 2011 may no longer be applicable to the proposed Solar PV Power Project.
- For those impacts that are identified to be relevant, the stakeholder responses and subsequently the significance of the impact were assumed to be no worse than those identified in 2011.





Map 2: Google Earth Imagery of the site area in March 2009 and July 2017 (Google Earth Pro, 2018)

## 2 IDENTIFICATION OF POTENTIAL SOCIO-ECONOMIC IMPACTS

### 2.1 Identification of potential direct and indirect socio-economic impacts

The socio-economic impact assessment for Redstone CSP Project identified a number of potential negative and positive socio-economic impacts during various stages of the project's lifespan. These are summarised in the following table. Given the earlier stated assumption that the possible socio-economic impacts of the PV Power Project will be similar in nature and type and may exclude some of these but not include new impacts, a critical review of the impacts that are envisaged to be created by the proposed PV Power Project that would result in the change of the socio-economic environment beyond the effect of Redstone CSP Project is undertaken.

**Table 1: Identification of relevant socio-economic impacts**

Impact	Redstone CSP Project			Relevance of the impact to the proposed PV Power Project	
	Status	Spatial scale	Significance	Comment	Decision
<b>Construction phase</b>					
Temporary increase country's production	Positive	National	Medium	<ul style="list-style-type: none"> <li>About US\$20 million will be spent on the construction of the power plant. About 45% of this amount will be spent on goods and services within South Africa, which is likely to stimulate domestic business activity among the manufacturing and services sectors.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Include in the current assessment
Temporary increase in country's GDP-R	Positive	National	Medium		
Temporary increase in employment	Positive	Regional	Medium	<ul style="list-style-type: none"> <li>The development will make use of the same workforce as that employed for the construction of Redstone CSP Project.</li> <li>There will be no change to the impact on the regional scale.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Exclude from the assessment
Increase in government revenue	Positive	National	Medium	<ul style="list-style-type: none"> <li>Additional investment will stimulate national government revenue through payment of Value Added Tax, as a minimum.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Include in the current assessment
Increase in household income	Positive	Regional	Medium	<ul style="list-style-type: none"> <li>No change to the impact on the local scale is expected.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Exclude from the assessment
Housing provision and basic services pressure	Negative	Regional	Medium	<ul style="list-style-type: none"> <li>Construction companies operating on site will make use of the workforce that would be present on site for the development of the Redstone CSP Project.</li> <li>No change to the impact is expected.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Exclude from the assessment

Impact	Redstone CSP Project			Relevance of the impact to the proposed PV Power Project	
	Status	Spatial scale	Significance	Comment	Decision
<b>Operational phase</b>					
Increase in production	Positive	National	High	<ul style="list-style-type: none"> <li>Addition of a PV Power Project will increase the operating costs and is likely to stimulate some business activity along the supply chain.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Include in the current assessment
Increase in GDP-R	Positive	National	High		
Increase in employment	Positive	National	High	<ul style="list-style-type: none"> <li>Operation of the PV Power Project will be shared with the workforce employed to operate the thermal power plant and maintain auxiliary facilities.</li> <li>No change in employment is envisaged.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Exclude from the assessment
Increase in household earnings	Positive	National	High	<ul style="list-style-type: none"> <li>Since the project will not lead to any notable change in employment, no change in household impact is expected with the operation of the PV Power Project.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Exclude from the assessment
Increase in government revenue	Positive	Regional	High	<ul style="list-style-type: none"> <li>Since the project will be located on the same farm portion as that of Redstone CSP Project but may use some of the local utilities above those consumed by the thermal power plant, small change in local government earnings (i.e. municipal rates) may be experienced. In addition, revenue derived by the project, will have an effect on production, will also lead to the national government earnings through collection of collection of corporate income taxes.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Include in the current assessment
Housing provision and basic services pressure	Negative	Regional	High	<ul style="list-style-type: none"> <li>No change to the workforce employed on site during operations is expected, which means that no additional demand for housing will be created.</li> <li>The PV Power Project will not lead to any notable change of this impact.</li> <li>The impact is not sensitive to the siting of the facility, i.e. location.</li> </ul>	Exclude from the assessment

It should also be noted that were the PV Power Project to be decommissioned upon the expiry of its lifespan, it will be done at the same time as that of Redstone CSP Project. Although activities and efforts spent on decommissioning will be shared with Redstone CSP Project, additional expenditure will be incurred, and material recycled in the process will generate some added revenue for the companies

involved in decommissioning. This in turn will lead to the increase in production, allow for the material recovery and reuse, and contribute to fiscus.

Considering the above analysis of the relevant of socio-economic impacts reviewed and assessed in 2011, only four potential direct and indirect impacts have been identified to be of relevance for the proposed PV Power Project:

- During construction:
  - Impact on production and Gross Domestic Product (GDP)
  - Impact on national government revenue
- During operation:
  - Impact on production and GDP
  - Impact on national and local government revenue
- During operation:
  - Impact on business revenue and resource/material recovery
  - Impact on national government revenue

## 2.2 Identification of potential cumulative socio-economic impacts

No knowledge of any other major developments planned for the area exists at the moment. However, the PV Power Project will be located next to Redstone CPS Project, which is to be developed concurrently with the project under review, as well as in close proximity to Lesedi and Jasper Solar PV Power Plants, which have been constructed a few years back and have been in operation for some time.

The Department of Environmental Affairs and Tourism's guidelines (DEAT, 2004) suggest that the identification of cumulative effects should focus on important and meaningful issues as "it is not practical to analyse the cumulative effects of an action on every environmental receptor". Furthermore, it is advised that the analysis should focus on "what is needed to ensure long-term productivity or sustainability of the resource" (DEAT, 2004).

In light of the above and considering the type of socio-economic impacts expected from the PV Power Project, no negative cumulative effects can be identified. As far as the positive cumulative effects are concerned none of the impacts identified to be relevant to the proposed project are envisaged to be classified as "what is needed to ensure long-term productivity or sustainability of the resource" and are therefore excluded from further assessment.

## 3 ASSESSMENT OF POTENTIAL SOCIO-ECONOMIC IMPACTS

Considering the types of socio-economic impacts identified in the previous section, the following tables assess the rating of the identified socio-economic impacts and provide enhancement measures to be considered during the time they are to ensue.

It is also important to note that none of the socio-economic impacts identified are sensitive to the location of the PV Power Project. This means that both of the site alternatives considered for the project are equally preferred and no differentiation can be made from a socio-economic perspective.

Phase: Construction					
Aspect:	Type: Socio-economic				
<b>Activity:</b>	<b>Investment into the development and construction of the Solar PV Facility</b>				
<b>Impact:</b>	<p><b>Impact on production and Gross Domestic Product (GDP)</b></p> <p><b>Direct Impact:</b> Expenditure on goods and services within South Africa required for the construction and development of the facility</p> <p><b>Indirect:</b> Increase in business sales of South African companies supplying goods and services and those that provide inputs to these suppliers</p> <p><b>Cumulative Impacts:</b> Added stimulus to the domestic economy and specifically industries and sectors participating in the renewable energy industry value chain</p> <p><b>Residual Impacts:</b> None identified</p>				
<b>Significance rating:</b>	<b>Duration</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Probability</b>	<b>Significance</b>
<b>Pre-Mitigation</b>	1	4	6	4	<b>44</b>
<b>Post-Mitigation</b>	1	4	6	4	<b>44</b>
<b>Mitigation Measures:</b>	<ul style="list-style-type: none"> <li>Identify and explore opportunities to procure goods and services from local and domestic suppliers that do not jeopardise bankability of the PV Power Project</li> </ul>				

Aspect:	Type: Socio-economic				
<b>Activity:</b>	<b>Investment into the development and construction of the Solar PV Facility</b>				
<b>Impact:</b>	<p><b>Impact on national government revenue</b></p> <p><b>Indirect:</b> Expenditure on goods and services required for the development and establishment of the PV Power Project will lead to the payment of taxes by the companies involved in the upstream value chain.</p> <p><b>Cumulative Impacts:</b> Increased revenue collection by the respective entities leading to the greater allocation of funds towards public service provision at different government levels</p> <p><b>Residual Impacts:</b> None identified</p>				
<b>Significance rating:</b>	<b>Duration</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Probability</b>	<b>Significance</b>
<b>Pre-Mitigation</b>	1	4	4	4	<b>36</b>

<b>Post-Mitigation</b>	1	4	4	4	<b>36</b>
<b>Mitigation Measures:</b>	None required				

Phase: Operation					
Aspect:	Type: Socio-economic				
<b>Activity:</b>	<b>Expenditure on operation of the proposed PV Power Project</b>				
<b>Impact:</b>	<p><b>Impact on production and Gross Domestic Product (GDP)</b></p> <p><b>Direct Impact:</b> Expenditure on goods and services within South Africa necessary to maintain the operations of the PV Power Project and associated support services and facilities</p> <p><b>Indirect:</b> Increase in business sales of South African companies supplying goods and services and companies where inputs to produce these goods and services are purchased from</p> <p><b>Cumulative Impacts:</b> Growth of the domestic economy</p> <p><b>Residual Impacts:</b> None identified</p>				
<b>Significance rating:</b>	<b>Duration</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Probability</b>	<b>Significance</b>
<b>Pre-Mitigation</b>	4	4	3	3	<b>33</b>
<b>Post-Mitigation</b>	4	4	3	3	<b>33</b>
<b>Mitigation Measures:</b>	<ul style="list-style-type: none"> <li>Identify and explore opportunities to procure goods and services to maintain the PV Power Project during the operation phase above and beyond those that would be done as part of Redstone CSP Project</li> </ul>				

<b>Activity:</b>	<b>Payment of rates and taxes</b>
<b>Impact:</b>	<p><b>Impact on national and local government revenue</b></p> <p><b>Direct:</b> The operation of the power plant may increase the usage of water and may increase the payment of local rates, which will lead to the increase of local government revenues and in turn improve the ability of local government to deliver its services; the increase in revenue derived from the operation of the PV Power Project will also lead</p>

	to the growth of company tax payments and VAT payments collected by the national authorities				
	<b>Indirect:</b> Expenditure on goods and services necessary for the maintenance of the power plant and associated infrastructure will also lead to the payment of VAT and company taxes by the companies along the power plant's supply value chain				
	<b>Cumulative Impacts:</b> Increased revenue collection by local and national government and ability of various public entities to deliver and improve on the delivery of their services				
	<b>Residual Impacts:</b> None identified				
<b>Significance rating:</b>	<b>Duration</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Probability</b>	<b>Significance</b>
<b>Pre-Mitigation</b>	4	4	2	4	40
<b>Post-Mitigation</b>	4	4	2	4	40
<b>Mitigation Measures:</b>	None required				

Phase: Decommissioning					
<b>Aspect:</b>	<b>Type: Socio-economic</b>				
<b>Activity:</b>	<b>Expenditure on decommissioning activities and recovery of valuable resources through recycling (i.e. copper cables, steel and aluminium structures, storage tanks, pipes, etc.)</b>				
<b>Impact:</b>	<b>Impact on production, Gross Domestic Product (GDP) and metallic and non-metallic materials inventory</b> <b>Direct Impact:</b> Expenditure on demolishing and decommissioning activities, which will result in the increase of turnover of companies directly involved in the process <b>Indirect:</b> Recovery of valuable metallic and non-metallic materials that on one hand lead to the generation of revenue for the owner and on the other hand allows for savings in production costs of companies that will use the recovered materials in their processes <b>Cumulative Impacts:</b> Improved resource utilisation <b>Residual Impacts:</b> None expected				
<b>Significance rating:</b>	<b>Duration</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Probability</b>	<b>Significance</b>

<b>Pre-Mitigation</b>	1	4	4	3	<b>27</b>
<b>Post-Mitigation</b>	1	4	4	3	<b>27</b>
<b>Mitigation Measures:</b>	<ul style="list-style-type: none"> <li>Develop and implement a material recovery strategy to optimise the use of valuable metallic and, where applicable, non-metallic materials comprising various components of the PV Power Project</li> </ul>				

Aspect:	Type: Socio-economic				
<b>Activity:</b>	<b>Expenditure on decommissioning activities and resale of recovered metallic and non-metallic materials</b>				
<b>Impact:</b>	<p><b>Impact on national government revenue</b></p> <p><b>Indirect:</b> Expenditure on goods and services required for the decommissioning of the PV Power Project will lead to the payment of taxes by the companies involved in the process of demolishing and recycling of the project's physical assets, as well as rehabilitation of the site</p> <p><b>Cumulative Impacts:</b> Increased revenue collection by the respective entities leading to the greater allocation of funds towards public service provision at different government levels</p> <p><b>Residual Impacts:</b> None identified</p>				
<b>Significance rating:</b>	<b>Duration</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Probability</b>	<b>Significance</b>
<b>Pre-Mitigation</b>	1	4	3	3	<b>21</b>
<b>Post-Mitigation</b>	1	4	3	3	<b>21</b>
<b>Mitigation Measures:</b>	None required				

## 4 IMPACT STATEMENT

The proposed project will be located on the same farm portions as Redstone CSP Project, which has already received environmental authorisation under the NEMA 107 of 1998 by the DEA Ref. Nr 12/12/20/2316 (AM7). Since the Google Imagery suggests that the changes in activities and land uses on the respective farm portions and in the area surrounding only included the establishment of two Solar PV facilities south-west, south and south-east of the site, the socio-economic impacts exerted by the PV Power Project will not be greater or equal to those identified and analysed for Redstone CSP Project in



2011. In many instances some of these impacts will not change since the proposed facility will be significantly smaller than Redstone CSP Project and will be sharing the workforce and on-site services with it.

As a result, the review of socio-economic impacts that are expected to ensue from the proposed PV Power Project revealed that the project will not lead to any negative impacts and will not notably change the positive effects that have previously been identified for Redstone CSP Project. Importantly, no meaningful and important cumulative effects are expected to ensue, and no residual risks have been identified to be associated with the proposed activity. Furthermore, the six potential socio-economic impacts identified to be relevant to the proposed project are positive in nature. Therefore, it can be concluded that from a socio-economic perspective the proposed PV Power Project should be considered for authorisation.

**Table 2: Summary of socio-economic impacts evaluation**

Impact	Status	Significance before mitigation	Mitigation	Significance after mitigation
<b>Construction</b>				
Impact on production and Gross Domestic Product (GDP)	Positive	44 (Medium)	<ul style="list-style-type: none"> <li>Identify and explore opportunities to procure goods and services from local and domestic suppliers that do not jeopardise bankability of the project</li> </ul>	44 (Medium)
Impact on national government revenue	Positive	36 (Medium)	<ul style="list-style-type: none"> <li>None required</li> </ul>	36 (Medium)
<b>Operation</b>				
Impact on production and Gross Domestic Product (GDP)	Positive	33 (medium)	<ul style="list-style-type: none"> <li>Identify and explore opportunities to procure goods and services to maintain the PV Power Project during the operation phase above and beyond those that would be done as part of Redstone CSP Project</li> </ul>	33 (medium)
Impact on national and local government revenue	Positive	40 (Medium)	<ul style="list-style-type: none"> <li>None required</li> </ul>	40 (Medium)
<b>Decommissioning</b>				
Impact on production and material recovery	Positive	27 (Low)	<ul style="list-style-type: none"> <li>Develop and implement a material recovery strategy to optimise the use of valuable metallic and, where applicable, non-metallic materials comprising various components of the PV Power Project</li> </ul>	27 (Low)
Impact on national government revenue	Positive	21 (Low)	<ul style="list-style-type: none"> <li>None required</li> </ul>	21 (Low)

With respect to the two site layouts, all potential impacts considered had no differential results for each layout. No fatal flaws have been identified for any of the layout options across all potential impacts considered; therefore, both of the sites are equally preferred from a socio-economic perspective.

**Table 3: Site alternative evaluation**

Alternative	Preference	Reasons (incl. potential issues)
Layout Option 1: to the west of the heliostat field	No Preference	No differentiation between this and the other option in terms of all socio-economic impacts considered
Layout Option 2: within the heliostat field	No Preference	No differentiation between this and the other option in terms of all socio-economic impacts considered.

## ANNEXURE A: IMPACT ASSESSMENT RATING METHODOLOGY

The significance (quantification) of potential environmental impacts identified has been determined using a ranking scale, based on the following (terminology has been taken from the Guideline Documentation on EIA Regulations, of the Department of Environmental Affairs and Tourism, April 1998):

- **Occurrence**
  - Probability of occurrence (how likely is it that the impact may occur?)
  - Duration of occurrence (how long may it last?)
  
- **Severity**
  - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?)
  - Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

Each of these factors has been assessed for each potential impact using the ranking scales represented in the following table:

**Table 4: Ranking scale of the four factors considered to determine significance rating**

Probability	Duration
1 - very improbable (probably will not happen)	1 - of a very short duration (0–1 years)
2 - improbable (some possibility, but low likelihood)	2 - of a short duration (2-5 years)
3 - probable (distinct possibility)	3 - medium-term (5–15 years)
4 - highly probable (most likely)	4 - long term (> 15 years)
5 - definite (impact will occur regardless of any prevention measures)	5 - permanent
Extent	Magnitude
1 - limited to the site	0 - small and will have no effect on the environment
2 - limited to the local area	2 - minor and will not result in an impact on processes
3 - limited to the region	4 - low and will cause a slight impact on processes
4 - will be national	6 - moderate and will result in processes continuing but in a modified way
5 - will be international	8 - high (processes are altered to the extent that they temporarily cease)
	10 - very high and results in complete destruction of patterns and permanent cessation of processes

The environmental significance of each potential impact is assessed using the following formula:

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Extent}) \times \text{Probability}$$

The maximum value is 100 Significance Points (SP). Potential environmental impacts were rated as high, moderate or low significance on the following basis:

- < 30 significance points = LOW environmental significance.

- 31- 60 significance points = MODERATE environmental significance
- 60 significance points = HIGH environmental significance

This section in the final impacts table then summarises the potential impacts associated to the three different phases of the proposed development activities. The potential impacts and risks are explored by investigating each aspect (i.e. air quality, Wetland and Ecological, heritage and social) associated to the proposed activities.

For the purpose of this section, the mitigation measures recommended will only be summarise to demonstrate the approach taken to manage each risk. A detailed mitigation plan will form part of the final Basic Assessment report.

**Table 5: Explanation of colour indicator**

Colour	Significance Points	Explanation
	≤ 30	<b>LOW</b> environmental significance
	31 - 60	<b>MODERATE</b> environmental significance
	> 60	<b>HIGH</b> environmental significance

## REFERENCES

DEAT. (2004). *Integrated Environmental Management Information Series: Cumulative Effects Series 7*.

Google Earth Pro. (2018, February 6).