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**Amendment Letter for the Redstone Solar Photovoltaic (PV) Project, a renewable energy development proposed as an auxiliary facility to support the existing Redstone Concentrated Solar Power (CSP) plant in the Northern Cape, South Africa.**

## 1. Introduction

This letter is in response to a request by Environmental Impact Management Services (EIMS) for Urban-Econ to amend the Basic Social Impact Assessment Report (completed April 2018) to reflect the changes in the basic assessment. The map below shows the location of the development in relation to the existing Redstone CSP Solar Thermal Project.

**Figure 1: Site Location and Layout**



The Redstone Solar Photovoltaic (PV) Project is a renewable energy development proposed as an auxiliary facility to support the existing Redstone Concentrated Solar Power (CSP) plant in the Northern Cape, South Africa. The project involves the installation of a solar PV system within the approved CSP project area to generate clean electricity for the plant's internal operational requirements.

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The PV facility will have a capacity of approximately 19.5 MW (DC) (15 MW AC) and will include a battery energy storage system of up to 30 MWh to enhance reliability and efficiency. Covering an area of approximately 19.5 hectares, the development will consist of solar panel arrays, associated electrical infrastructure, energy storage components, and supporting services such as access roads and internal cabling.

The primary purpose of the project is to supply renewable energy for auxiliary loads within the CSP facility, thereby reducing reliance on external electricity sources, improving operational efficiency, and lowering overall greenhouse gas emissions. The project forms part of South Africa's broader transition toward cleaner energy and supports national and provincial objectives promoting renewable energy development, particularly within the Northern Cape as a strategic solar energy hub.

There has been no change to the project description since the 2018 evaluation.

## 2. Socio-Economic Impacts

### 2.1 Methodology

The methodology used to gain an understanding of the proposed amendment adopted the same methodology that was used for the initial assessment. The details of the methodology are, therefore not set out in this amendment letter but can be found in Section 1.4 of the original report. The impact assessment ratings methodology can be found in Annexure A of this letter.

### 2.2 Specialist Comment

The environment has not changed significantly since the original assessment; there have not been any significant developments within the affected properties that would have altered the social environment. The Redstone CSP facility has been constructed and is operational.

The initial socio-economic assessment of the development identified several impacts both during the construction phase and the operational phase, as outlined in Table 2.1. The purpose of this assessment is to determine if these impacts are still applicable, and if their nature, extent, intensity, duration, or significance has changed since the initial assessment in April 2018.

**Table 2.1: Summary of impacts during construction and operational phases, 2018**

| Evaluation Criteria                                                         | Nature of Impact |                                 |                                |
|-----------------------------------------------------------------------------|------------------|---------------------------------|--------------------------------|
|                                                                             | Status           | Before Mitigation / Enhancement | After Mitigation / Enhancement |
| <b>Construction Phase</b>                                                   |                  |                                 |                                |
| Impact on Production and GDP                                                | Positive         | Moderate                        | Moderate                       |
| Impact on National Government Revenue                                       | Positive         | Moderate                        | Moderate                       |
| <b>Operational Phase</b>                                                    |                  |                                 |                                |
| Impact on Production and GDP                                                | Positive         | Moderate                        | Moderate                       |
| Impact on National and Local Government Revenue                             | Positive         | Moderate                        | Moderate                       |
| <b>Impact on Decommissioning</b>                                            |                  |                                 |                                |
| Impact on Production, GDP and Metallic and Non-Metallic Materials Inventory | Positive         | Low                             | Low                            |
| Impact on National Government Revenue                                       | Positive         | Low                             | Low                            |

Based on an understanding of the proposed amendment, it is Urban-Econ's opinion that the identified impacts for the construction, operational and decommissioning phase as highlighted within Table 2.1, will remain the same, however, additional impacts have been identified as indicated in Table 2.2.

**Table 2.2: Summary of impacts during construction and operational phases, 2026**

| Evaluation Criteria                                                         | Nature of Impact |                                 |                                |
|-----------------------------------------------------------------------------|------------------|---------------------------------|--------------------------------|
|                                                                             | Status           | Before Mitigation / Enhancement | After Mitigation / Enhancement |
| <b>Construction Phase</b>                                                   |                  |                                 |                                |
| Impact on Production and GDP                                                | Positive         | Medium to High (12)             | Medium to High (13)            |
| Impact on National Government Revenue                                       | Positive         | Medium to High (10)             | Medium to High (10)            |
| <i>Increase in employment</i>                                               | <i>Positive</i>  | Medium to High (9)              | Medium to High (10)            |
| <i>Skills development</i>                                                   | <i>Positive</i>  | Medium to High (9)              | Medium to High (10)            |
| <i>Impact on sense of place</i>                                             | <i>Negative</i>  | <i>Medium to Low (-6)</i>       | <i>Medium to Low (-8)</i>      |
| <b>Operational Phase</b>                                                    |                  |                                 |                                |
| Impact on Production and GDP                                                | Positive         | Medium to High (13)             | Medium to High (13)            |
| Impact on National and Local Government Revenue                             | Positive         | Medium to High (12)             | Medium to High (12)            |
| <b>Impact on Decommissioning</b>                                            |                  |                                 |                                |
| Impact on Production, GDP and Metallic and Non-Metallic Materials Inventory | Positive         | Low to Medium (6,75)            | Low to Medium (6,75)           |
| Impact on National Government Revenue                                       | Positive         | Low to Medium (6)               | Low to Medium (6)              |

Mitigation/enhancement for additional impacts identified:

**Increase in employment:**

- It is recommended that the contractor employ local semi-skilled and unskilled labour from the study area.
- The developer should stipulate in their contracts with contractor that local labour should be used for e.g., bush clearing, road construction and fencing
- Ward councillors could assist in determining available local labourers that could be considered for possible employment.

**Skills Development:**

- In order to maximise the positive impact, it is suggested that the project company provide training courses for employees where feasible to ensure that employees gain as much as possible from the work experience.
- Facilitate the transfer of knowledge between experienced employees and the staff.
- Perform a skills audit to determine the potential skills that could be sourced in the area.

**Impact on Sense of Place:**

- Soils should be replaced and the construction area, as well as laydown areas should be rehabilitated as soon as possible after construction.
- The construction site should be kept litter free.
- Overall site rehabilitation should occur as soon as the construction process allows.
- The recommendations made by the Visual Impact Assessment should be adhered to.

The following impact's mitigations and/or enhancements remains the same:

**Impact on Production and GDP:**

- Identify and explore opportunities to procure goods and services from local and domestic suppliers that do not jeopardise bankability of the PV Power Project
- 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

**Impact on National Revenue:**

- None required

Based on an understanding of the proposed amendment, it is Urban-Econ's opinion that the additional identified impacts for the construction phase as highlighted within Table 2.2, will not have a significant impact on the proposed project. The impact on job creation during the construction phase will have a positive effect on the regional and local workforce, it will assist in reducing the unemployment rate in the area, albeit only for a temporary time during the construction phase. The impact on skills development will have a positive effect for the regional and local workforce, due to the experience that will be transferred from skilled workers. The impact on sense of place has a low significance if the necessary mitigation measures are followed.

**3. Conclusion**

To conclude, Urban-Econ assessed the proposed amendments and confirms that the time lapsed will not change the scope, nature or level of the impacts and therefore no change to the initial assessment conducted should occur. The additional impact identified will have a positive impact, whereas the sense of place impact will have a low significance if the necessary mitigations are followed. Furthermore, from a socio-economic perspective there is no reason why the proposed amendment should not be authorised.



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## Annexure A: Impact Assessment Ratings Criteria

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).

### Assessment Criteria

|                         |    |                                                                                                                                                                                                                                                                                       |             |                            |
|-------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------|
| Nature                  | -1 | Likely to result in a negative/ detrimental impact                                                                                                                                                                                                                                    | CONSEQUENCE | ENVIRONMENTAL SIGNIFICANCE |
|                         | 1  | Likely to result in a positive/ beneficial impact                                                                                                                                                                                                                                     |             |                            |
| Extent                  | 1  | Activity (i.e. Highly localised, limited to the area applicable to the specific activity)                                                                                                                                                                                             |             |                            |
|                         | 2  | Site (i.e. within the development property or site boundary, or the area within a few hundred meters of the site)                                                                                                                                                                     |             |                            |
|                         | 3  | Local (i.e. beyond the site boundary within the Local administrative boundary (e.g. Local Municipality) or within consistent local geographical features, or the area within 5 km of the site)                                                                                        |             |                            |
|                         | 4  | Regional (i.e. Far beyond the site boundary, beyond the Local administrative boundaries within the Regional administrative boundaries (e.g. District Municipality), or extends into different distinct geographical features, or extends between 5 and 50 km from the site).          |             |                            |
|                         | 5  | Provincial / National / International (i.e. extends into numerous distinct geographical features, or extends beyond 50 km from the site).                                                                                                                                             |             |                            |
| Duration                | 1  | Immediate (<1 year, quickly reversible)                                                                                                                                                                                                                                               |             |                            |
|                         | 2  | Short term (1-5 years, less than project lifespan)                                                                                                                                                                                                                                    |             |                            |
|                         | 3  | Medium term (6-15 years)                                                                                                                                                                                                                                                              |             |                            |
|                         | 4  | Long term (15-65 years, the impact will cease after the operational life span of the project)                                                                                                                                                                                         |             |                            |
|                         | 5  | Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction/ operation/ decommissioning).                                                                                                                                                |             |                            |
| Magnitude/<br>Intensity | 1  | Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)                                                                                                                                             |             |                            |
|                         | 2  | Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected, or affected environmental components are already degraded)                                                                               |             |                            |
|                         | 3  | Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; moderate improvement for +ve impacts; or where change affects area of potential conservation or other value, or use of resources).    |             |                            |
|                         | 4  | High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease; high improvement for +ve impacts; or where change affects high conservation value areas or species of conservation concern)                                  |             |                            |
|                         | 5  | Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts; or disturbance to pristine areas of critical conservation value or critically endangered species) |             |                            |
| Reversibility           | 1  | Impact is reversible without any time and cost.                                                                                                                                                                                                                                       |             |                            |
|                         | 2  | Impact is reversible without incurring significant time and cost.                                                                                                                                                                                                                     |             |                            |
|                         | 3  | Impact is reversible only by incurring significant time and cost.                                                                                                                                                                                                                     |             |                            |
|                         | 4  | Impact is reversible only by incurring prohibitively high time and cost.                                                                                                                                                                                                              |             |                            |

|                                 |        |                                                                                                                                                                                                                                             |                       |  |
|---------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--|
|                                 | 5      | Irreversible Impact                                                                                                                                                                                                                         |                       |  |
| Probability                     | 1      | Improbable (Rare, the event may occur only in exceptional circumstances, the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <5% chance). | PROBABILITY           |  |
|                                 | 2      | Low probability (Unlikely, impact could occur but not realistically expected; >5% and <20% chance).                                                                                                                                         |                       |  |
|                                 | 3      | Medium probability (Possible, the impact may occur; >20% and <50% chance).                                                                                                                                                                  |                       |  |
|                                 | 4      | High probability (Likely, it is most probable that the impact will occur - > 50 and <90% chance).                                                                                                                                           |                       |  |
|                                 | 5      | Definite (Almost certain, the impact is expected to, or will, occur, >90% chance).                                                                                                                                                          |                       |  |
| Cumulative Impact               | 1      | Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.                                              | PRIORITISATION FACTOR |  |
|                                 | 2      | Medium: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.                                           |                       |  |
|                                 | 3      | High: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change.                             |                       |  |
| Irreplaceable loss of resources | 1      | Low: Where the impact is unlikely to result in irreplaceable loss of resources.                                                                                                                                                             |                       |  |
|                                 | 2      | Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.                                                     |                       |  |
|                                 | 3      | High: Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).                                                                                                                         |                       |  |
| Degree of Confidence            | Low    | <30% certain of impact prediction                                                                                                                                                                                                           |                       |  |
|                                 | Medium | >30 and < 60% certain of impact prediction                                                                                                                                                                                                  |                       |  |
|                                 | High   | >60% certain of impact prediction                                                                                                                                                                                                           |                       |  |

**ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED  
HUMANSRUS SOLAR THERMAL ENERGY POWER PLANT  
DEVELOPMENT ON A PORTION OF THE FARM HUMANSRUS 469  
NEAR POSTMASBURG, NORTHERN CAPE PROVINCE**

**May 2011**

**Socio-Economic Impact Assessment: Scoping Phase Input**

**Prepared for:**

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## 1. INTRODUCTION

Urban-Econ Development Economists was appointed by SSI Engineers and Environmental Consultants to undertake a socio-economic impact assessment study for the proposed construction and operation of the Humansrus Solar Thermal Power Plant or otherwise referred to as a Concentrated Solar Power (CSP) Plant, Postmasburg, Northern Cape. This report presents the socio-economic specialist's input into the scoping phase of the project.

### 1.1 Project background and description

Economic development and the ability of the national government to alleviate poverty are indirectly reliant on the supply of electricity in South Africa. The Integrated Resource Plan (February 2010) projected that an additional capacity of 41 346 MW will be required to support the average economic growth rate of 4.5% per annum over the next twenty years and ensure adequate reserves. The required expansion is almost two times the size of the existing capacity of the system. A significant component of the above-mentioned plan is, amongst others, the expansion of the use of renewable energy sources to reduce carbon emissions involved in generating electricity and involvement of Independent Power Producers in these projects.

In line with the IRP2010, SolarReserve SA (Pty) Ltd (SolarReserve) proposed the construction of a CSP Plant, to be known as the Humansrus CSP project. The CSP Plant will have an installed capacity of up to 100 MW.

SolarReserve is one of the world's leading companies in the field of renewable energy generation. The renewable energy generation market faces two fundamental problems – (1) scalability and (2) issue of electricity storage. Solar Reserve has managed to bridge these problems with their CSP technology. CSP Plants draw their heat from the sun, an unlimited source of pure clean energy – and unlike wind and photovoltaic, the technology implemented by Solar Reserve can be delivered when it is needed dependent solely on demand and not climatic factors. This feature of the technology allows Solar Reserve to bridge the key barriers pertinent to renewable energy generation – scalability and storage.

The unique components in SolarReserve's power towers are the molten salt storage loop and the power tower central receiver. The molten salt storage loop enables the plant to generate electricity whenever it is needed - 24 hours per day or during "peak demand" periods. Molten salt is an efficient and inexpensive medium to store energy. The salt used in the process is an environmentally friendly mixture of sodium and potassium nitrate, the same ingredients used in garden fertiliser.

### 1.2 Scope of the study

The purpose of the Socio-Economic Impact Assessment is to determine the potential positive and negative effects of the proposed CSP Plant on the local and regional economies and to compare their effects with the "no go" alternative. The "no go" alternative assumes that the proposed mining operation is not established at the intended location, nor anywhere else in the country. The "no go" alternative represents the current status of the environment, including the socio-economic situation.

The current report is prepared as part of the Socio-Economic Study and is used as inputs into the Scoping Report that is compiled by the Environmental Practitioner. The Scoping Phase inputs address only a portion of the scope of work involved in the Socio-Economic Study. Its purpose is as follows:

- Provide a description of the environment that may be affected by the proposed project; particularly its socio-economic characteristics, and

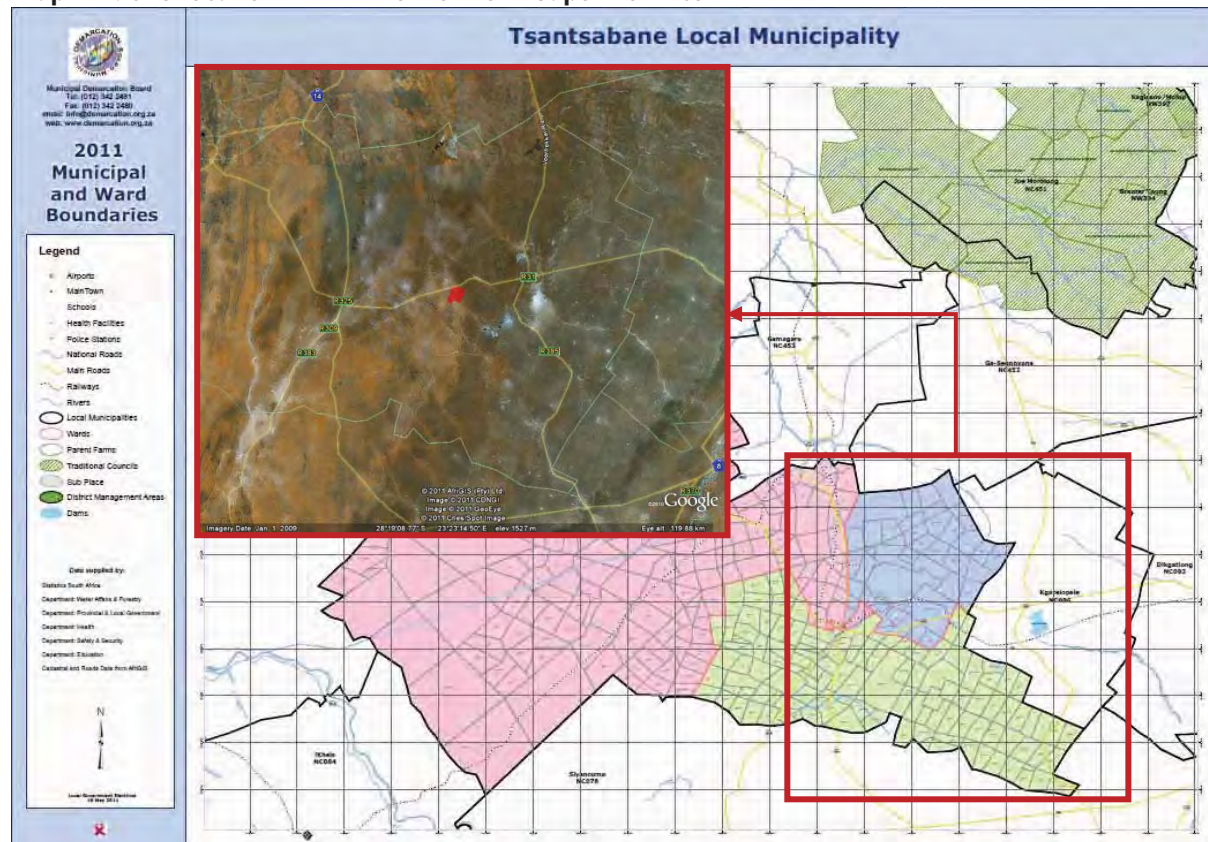
- Identify the potential impacts to be assessed in the EIA phase.

The scoping report therefore aims at identifying social, socio-economic, and economic issues that will form part of the detailed EIA phase.

## 1.3 Project's location and study area delineation

The proposed site for the Humansrus CSP Plant is located on a portion of the farm Humansrus No. 469 situated in the Northern Cape Province approximately 30 kilometres north-east of the town of Postmasburg. The site falls within the Tsantsabane Local Municipality (LM), which in turn forms part of the Siyanda District Municipality (DM) - one of the five districts of the Northern Cape Province of South Africa.

**Map 1-1: Site location within the Northern Cape Province**



Source: [www.demarcation.org.za](http://www.demarcation.org.za) and Google Map, 2011

In order to delineate the study area, it is important to understand the concept of socio-economic impacts. Socio-economic impacts can be of a different nature and spatial extent. The latter differs significantly depending on the type of activity that is being analysed and the structure and composition of the locality where it is to be established. The more diversified the immediate locality of the project is in terms of its socio-economic variables, the more concentrated the impact will be in that area. It is very rare, though, to find a case when the demands of the proposed activity to be constructed and operated can be fully satisfied within the immediate locality of the project. Therefore, more often than not, economic impacts derived from any activity are spread throughout various administrative units. Understanding the potential distribution and concentration of impacts throughout the area is important to determine the magnitude and significance of these impacts in the context of spatial units.

The study area's delineation is usually done in terms of three levels – primary, secondary and tertiary. From a socio-economic impact perspective, the primary study area refers to the locality where the

immediate economic effects of the proposed activity will be observed. This is usually defined considering the actual location of the proposed project, proximity to skilled and unskilled labour, and juxtaposition relative to suppliers. The primary study area is usually relatively small and includes administrative units from where the majority of labour for the proposed project will be supplied and where some parts of the capital and operational budgets will be spent, such as a city, town or LM depending on data availability. The secondary study area is generally far greater than the primary study area. It usually has a relatively diversified economy, which is why it is also characterised as an area where the majority of the domestic expenditure on the project will be distributed. The third tier of a delineated study area is the tertiary study area. From an economic impact perspective, it includes all impacts that would be derived from the project's domestic expenditure.

The proposed project is located within the Siyanda DM area. The closest major town to the site by road is Postmasburg (approximately 30 km). Other towns within 50 kilometres of the proposed site are Danielskuil (approximately 30km) to the north-east and Lime Acres (approximately 27km) to the southeast. It is estimated that most of the people who will be employed by the proposed project will come from the nearby settlements and above-mentioned towns. As far as procurements of services and equipment during construction and operation of the project are concerned, some of these will be sourced from the Northern Cape. Given the fact though that its economy is not diversified, it could be argued that a significant portion of these services will be sourced from the rest of South Africa. Given the above, the following delineation of the study areas is assumed:

- Primary study area includes the site and the Tsantsabane LM;
- Secondary study area includes the Siyanda DM and Northern Cape, and
- Tertiary study area is South Africa.

#### 1.4 Methodology for scoping phase

Given the requirements of the Scoping Phase, a three step methodology was employed to complete it. These included:

- **Introductory chapter.** The introductory chapter focuses on providing the background to the study and the project itself. It also outlines all the assumptions used in the impact modelling exercise;
- **Baseline profiling.** Baseline profiling is the key component of the Scoping Phase input to be provided by the socio-economic specialist. It includes the description of the study area in terms of selected socio-economic variables. This information is used to interpret the socio-economic impacts that could be derived from the project in the context of the local, provincial and national economies. It includes the analysis of parameters such as population size and household numbers, structure and growth of the economy, labour force, employment situation and service delivery. Profiling for the study was done making use of Quantec Research database and selected StatsSA statistics, such as Labour Force Surveys and Community Survey 2007;
- **Identifying the anticipated impacts.** This step includes the identification of the socio-economic impacts that could be expected during the construction and operational phases of the proposed CSP Plant. The list of impacts, inclusive of their nature and extent, represents the impacts that are usually associated with similar projects. Its purpose is to ensure that the specialist study contains a detailed analysis thereof, which means that their list, as well as other characteristics could change from the ones outlined in the Scoping Phase inputs report once the detailed assessment is undertaken; and

- **Reporting.** The data and information gathered during the study was included and presented as part of the Scoping Phase Input Report.

## 2. BASELINE INFORMATION

This chapter examines key socio-economic characteristics of the study area, as per delineation provided in the previous chapter. This is essential as it provides both qualitative and quantitative data related to the economies under observation. It should be noted that where possible information is provided for 2011, which is an estimate based on the historical trends and available statistics.

The following socio-economic indicators are analysed in this chapter:

- Population size and growth;
- Average household size;
- Income and Expenditure patterns;
- Labour Market dynamics;
- Production;
- Gross Domestic Product per Region, and
- Service delivery and access to tenure.

### 2.1 Population size and growth

The population of any geographical area is the cornerstone of the development process, as it affects the economic growth through the provision of labour and entrepreneurial skills, and determines the demand for the production output. Examining population dynamics is essential to gaining an accurate perspective of those who are likely to be affected by any prospective development or project. This sub-section describes the status quo of the study area's population as estimated for 2011.

In 2011, South Africa's population is expected to be above 50 million (Table 2-1), with 1.1 million people residing in the Northern Cape area. The Siyanda DM is housing 247 611 people, or 22.5% of the provincial population while the Tsantsabane LM has a population of 29 150 people, i.e. just above 10% of the DM's population.

**Table 2-1: Population size (2011) and historical growth rates (1995-2011)**

| Study area     | 2011       | Historical growth rates |           |           |           |
|----------------|------------|-------------------------|-----------|-----------|-----------|
|                |            | 1995-2000               | 2000-2005 | 2005-2010 | 1995-2011 |
| South Africa   | 50 430 328 | 1.7%                    | 1.3%      | 1.1%      | 1.4%      |
| Northern Cape  | 1 101 318  | 1.2%                    | 0.4%      | 0.3%      | 0.6%      |
| Siyanda DM     | 247 611    | 1.4%                    | 0.5%      | 0.4%      | 0.8%      |
| Tsantsabane LM | 29 150     | 0.7%                    | 0.9%      | 1.2%      | 0.9%      |

Source: Urban-Econ calculations based on Quantec, 2011

As indicated in the table above, the Compounded Annual Growth Rate (CAGR) of the primary study area's population between 1995 and 2011 was 0.9%. It was higher than the CAGR of the Siyanda DM and the provincial population during the same period, but lower than that of South Africa's population. Whilst the population of the Siyanda DM, Northern Cape and South Africa experienced a slowdown in their growth rates, the primary study area's population growth rate has been increasing (Table 2-1). This could be explained due to the fact that mines constitute a prominent land use in the area, which is home to the Assmang Iron Ore Mine at Beeshoek and the newly established Kolomela under Kumba.

## 2.2 Household numbers and size

Household data enables a richer interpretation of the results of socio-economic impact analyses. A large increase in household numbers coupled with the increase in disposable income levels result in greater consumption, which in turn stimulate local production and as a result the economy. In addition, knowledge of the size of the study areas in terms of households is useful for interpretation of the magnitude of the economic impact that could be created by the proposed activity.

South Africa have 13 385 517 households, which means that the average household size in the country is 3.8. The Northern Cape is estimated to have above 281 015 households and a bigger average household size than in the country. The Siyanda DM has 61 453 households and the biggest average household size in all of the study areas (4.1). The primary study area is expected to have 7 485 households and almost the same average household size (3.9) as the rest of the Province and country.

**Table 2-2: Household numbers (2011), household size (2011) and its historical growth rate (1995-2011)**

| Study area     | HH number | Average HH size | Household number historical growth rates |         |         |         |
|----------------|-----------|-----------------|------------------------------------------|---------|---------|---------|
|                |           |                 | 1995/00                                  | 2000/05 | 2005/10 | 1995/11 |
| South Africa   | 13 385 51 | 3.8             | 4.0%                                     | 2.1%    | 1.0%    | 2.3%    |
| Northern Cape  | 281 015   | 4.0             | 3.6%                                     | 1.1%    | -0.2%   | 1.5%    |
| Siyanda DM     | 61 453    | 4.1             | 3.5%                                     | 1.3%    | 0.3%    | 1.7%    |
| Tsantsabane LM | 7 485     | 3.9             | 2.3%                                     | 2.0%    | 1.8%    | 2.0%    |

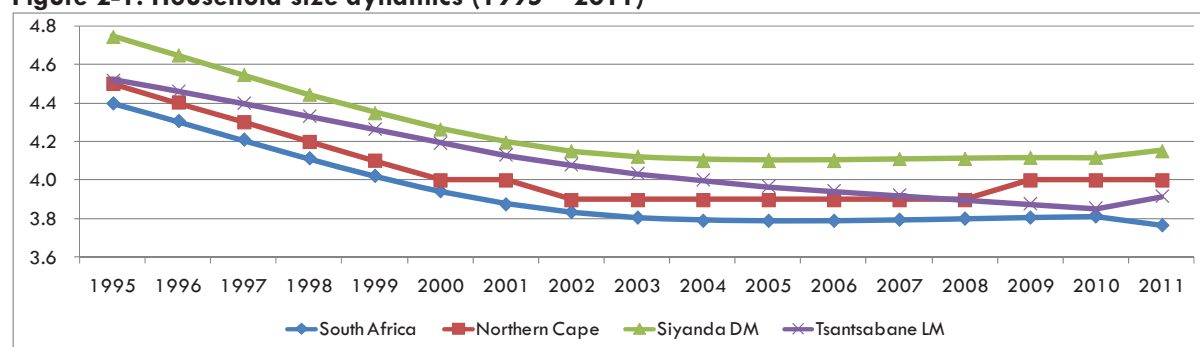
Source: Urban-Econ calculations based on Quantec, 2011

Over the years, as indicated in Table 2-2, the rates at which the numbers of households in the secondary and tertiary study areas were increasing have been slowing down, which mirrors the trend observed with respect to population dynamics in these study areas. In the primary study area, the trend though was different – with the population growth rate increasing, the household growth rate was also slowing down. When compared with population growth rates, it could be noted that the household growth rate in South Africa was on par with the population growth rate between 2005 and 2010. In the Northern Cape and the Siyanda DM, household growth rates were however significantly lower than their population growth rates, which means that the average household size in these areas has been slightly increasing.

The main factors that affect the household growth include, besides the population increase, the change in age structure and incidence rate, or the likelihood of people of a certain age to start a new household. The significant difference between a household growth rate and a population growth rate, though, is usually attributed to the change in age structure.

Household size is also influenced by many other factors such as culture, traditions, education levels, income levels, etc. Over the years, it has been observed that the size of an average household in the country has been declining (Figure 2-1).

**Figure 2-1: Household size dynamics (1995 – 2011)**



Source: Urban-Econ's calculations based on Quantec, 2011

As illustrated in Figure 2-1, the average household size in South Africa in 1995 was 4.4, whilst in 2011 it was 3.8. In the secondary and primary study areas, the average household size also dropped significantly between 1995 and 2011, although it should be noted that in the Northern Cape, the Siyanda DM and the Tsantsabane LM, the average household size was slightly higher than in South Africa. In the last three years, a slight increase in the average household size in all areas is observed, which could suggest that the trend of the sharp decline in the household size observed between 1995 and 2002 has been reversed.

## 2.3 Income and expenditure patterns

Income distribution is one of the most important indicators of social welfare, as income is a primary means by which people are able to satisfy their basic needs such as food, clothing, shelter, health, services, etc. Changes in income inflict changes in the standard of living, more specifically: a positive change in income can assist individuals, households, communities and countries to improve living standards.

There is a direct linkage between the household expenditure and economic growth. Increase in household expenditure means a greater demand for goods and services, which means an increase in production and positive change in the size of an economy. As has been seen in 2005-2006 in South Africa, robust increase in disposable income coupled with low interest rates in the country stimulated an increase in consumption by households, in particular durable and semi-durable goods, which in turn had a positive impact on the country's economy. Knowledge of the volume of the disposable income and the expenditure patterns of households, therefore, can provide vital intelligence with respect to the sectors that are most dependent on the household income and therefore would be most affected in the case of change in household income.

Table 2-2 shows income distribution in study areas as captured in the Community Survey 2007. More recent data, unfortunately, are not available, whilst historical information is not robust and reliable enough to escalate the latest figures and estimate the situation in 2011 with great confidence.

Based on the 2007 figures it could be concluded that the household income situation mirrored some of the patterns observed in the Northern Cape and in the rest of the country. First of all, the percentage of households earning less than R3 200 per month (R38 400 per annum) in the Tsantsabane LM area was slightly higher than in the Siyanda DM and the Province, but lower than in the rest of the country in 2007. Overall, more than half of households earned less than R3 200 per month in all the study areas and the country in 2007. At the same time, though the percentage of households without any income at all was significantly higher in the primary study area than in any other study area analysed. From an average household income perspective, an average household in the primary study area earned more or less the same as an average household in the Siyanda DM, what means that there are more

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households in the Tsantsabane LM with a higher income, but this average household income is significantly less than households in the Northern Cape and South Africa.

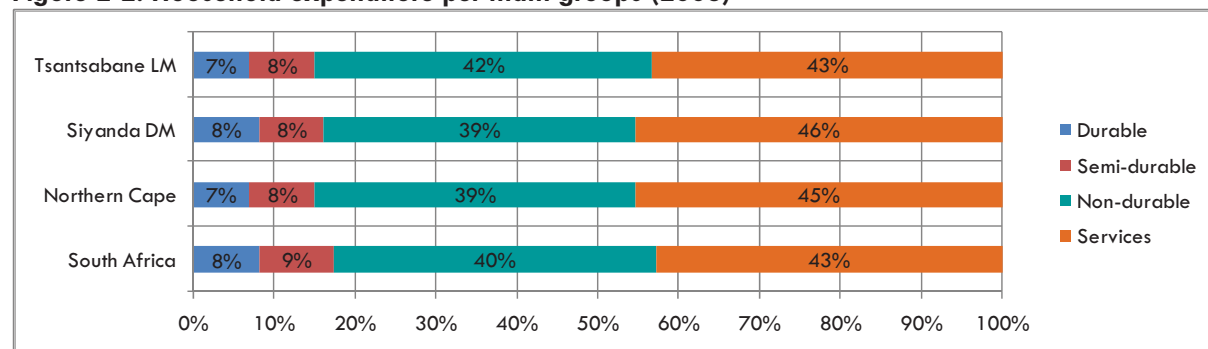
**Table 2-2: Income distribution (2007)**

| Income category (per annum) | South Africa | Northern Cape | Siyanda DM | Tsantsabane LM |
|-----------------------------|--------------|---------------|------------|----------------|
| No income                   | 8.2%         | 6.8%          | 4.9%       | 11.4%          |
| R1 - R4 800                 | 5.0%         | 3.5%          | 2.0%       | 3.1%           |
| R4 801 - R9 600             | 9.0%         | 7.9%          | 9.3%       | 7.9%           |
| R9 601 - R19 200            | 18.9%        | 20.2%         | 22.1%      | 16.7%          |
| R19 201 - R38 400           | 19.1%        | 19.8%         | 19.6%      | 20.3%          |
| R38 401 - R76 800           | 11.4%        | 13.2%         | 12.3%      | 15.3%          |
| R76 801 - R153 600          | 7.6%         | 8.0%          | 6.8%       | 8.9%           |
| R153 601 - R307 200         | 5.3%         | 4.7%          | 3.7%       | 3.6%           |
| R307 201 - R614 400         | 2.8%         | 2.2%          | 1.7%       | 2.5%           |
| R614 401 - R1 228 800       | 0.9%         | 0.6%          | 0.6%       | 0.6%           |
| R1 228 801 - R2 457 600     | 0.3%         | 0.2%          | 0.1%       | 0.3%           |
| More than R2 457 600        | 0.2%         | 0.2%          | 0.1%       | 0.1%           |
| No response                 | 11.1%        | 12.6%         | 16.8%      | 9.4%           |
| TOTAL                       | 100%         | 100%          | 100%       | 100%           |
| Weighted av. (2011 prices)  | R8 920       | R8 048        | R6 938     | R6 509         |

Source: Urban-Econ calculations based on Community Survey 2007, 2011

Figure 2-2 illustrates the expenditure pattern of households in the study areas. It shows that there are slight differences between expenditure patterns of households in the Tsantsabane LM and other study areas, particularly the Siyanda DM. In the primary study area, households tend to spend the same share of their disposable income on services and non-durable goods, whilst in the Siyanda DM and the Northern Cape households tend to spend more on services than on non-durable goods. The share of disposable income spent by the Tsantsabane LM households on non-durable goods is also greater than the share of expenditure on these goods by households residing in the Siyanda DM, the Northern Cape and the rest of the country. The share of expenditure on durable goods and semi-durable goods is almost similar for all the study areas.

**Figure 2-2: Household expenditure per main groups (2008)**



Source: Quantec, 2011

Table 2-3 provides more detailed information on the items that households spend the largest share of their income on.

**Table 2-3: Dominant expenditure items (2008)**

| Expenditure type             | South Africa | Northern Cape | Siyanda DM | Tsantsabane LM |
|------------------------------|--------------|---------------|------------|----------------|
| Food, beverages and tobacco  | 26.3%        | 27.0%         | 26.4%      | 28.7%          |
| Rent                         | 12.4%        | 15.2%         | 15.3%      | 15.2%          |
| Transport and communication  | 9.1%         | 9.1%          | 9.3%       | 8.5%           |
| Medical services             | 5.9%         | 5.9%          | 5.9%       | 5.6%           |
| Personal transport equipment | 4.5%         | 3.9%          | 4.0%       | 3.7%           |

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| Expenditure type      | South Africa | Northern Cape | Siyanda DM | Tsantsabane LM |
|-----------------------|--------------|---------------|------------|----------------|
| Clothing and footwear | 5.0%         | 4.2%          | 4.1%       | 4.2%           |

Source: Quantec, 2011

As indicated in Table 2-3, expenditure on food, beverage, and tobacco products is the largest expenditure item amongst households in all areas, although households in the Tsantsabane LM tend to allocate a slightly bigger share of their income for these expenses than households in the rest of the province and country. Larger portions of the Northern Cape, Siyanda DM and the Tsantsabane LM households' incomes has to be allocated towards paying rent than is the case of households in the rest of South Africa. The Tsantsabane LM households also tend to spend a smaller share of their income on transportation than households in the Siyanda DM and the rest of the study areas. Expenditure on personal transport equipment in the primary area is lower than in the secondary and tertiary areas and spending on clothing and footwear is smaller than in South Africa, but the same as in the Northern Cape.

### 2.4 The labour market

Employment is the primary means by which individuals who are of working age may earn an income that will enable them to provide for their basic needs. As such, employment and unemployment rates are important indicators of socio-economic well-being. The following paragraphs examine the study area's labour market from a number of angles, including employment rate and sectoral employment patterns.

#### Information box: Unemployed as per official definition

Unemployed are people, who:

- a) Did not work during the seven days prior the interview;
- b) Want to work and are available to start work within a week of the interview, and
- c) Have taken active steps to look for work or to start some form of self-employment in the four weeks prior to the interview.

The composition of the labour force in the primary study area, Siyanda DM, Northern Cape and the country as reported by the Labour Force Survey is detailed in Table 2-4. Unfortunately, though, since the latest Labour Force survey does not report on the data for the District Municipalities, information for the study areas is sourced from the Quantec database and represents 2009 figures. This allows for a comparison between the study areas.

**Table 2-4: Labour force statistics (2009)**

| Indicators                    | South Africa | Northern Cape | Siyanda DM | Tsantsabane LM |
|-------------------------------|--------------|---------------|------------|----------------|
| <b>Working age population</b> | 31 496 936   | 704 615       | 163 008    | 18 707         |
| ▶ <b>Non-EA</b>               | ▶ 15 131 133 | ▶ 329 386     | ▶ 71 740   | ▶ 7 811        |
| ▶ <b>Labour Force</b>         | ▶ 16 365 803 | ▶ 375 229     | ▶ 91 268   | ▶ 10 896       |
| ▶ <b>Employed</b>             | ▶ 12 260 902 | ▶ 271 688     | ▶ 68 166   | ▶ 6 851        |
| ▶ <b>Unemployed</b>           | ▶ 4 104 901  | ▶ 103 541     | ▶ 23 101   | ▶ 4 044        |
| Unemployment rate             | 25.1%        | 27.6%         | 25.3%      | 37.1%          |
| LF participation rate         | 52.0%        | 53.3%         | 56.0%      | 58.2%          |

Source: Quantec, 2011

In 2009, South Africa had about 31.5 million people within the working age population. Of these, about 15.1 million were non-economically active and 16.4 million formed part of the labour force. This means that the labour force participation rate in the country was 52.0%. The number of the employed

people in South Africa was about 12.3 million, leaving 4.1 million people or 25.1% of the labour force unemployed.

The Northern Cape accounted for 2.3% of the national working age population, or 704 615 people. In 2009, just over 53% of the provincial working age population participated in the economy or were economically active. These people encompassed a labour force, which was divided into 271 688 employed and 103 541 unemployed people, indicating a 27.6% unemployment rate in the province.

Siyanda DM had a bigger percentage of the working age population participating in the economic activities than that of the province and the country. In Siyanda, 56.0% of the working age population were economically active, with a 25.3% of these people being unemployed.

The primary study area had a working age population of 18 707 people and a labour force of 10 896 people, of who only 6 851 were employed. This means that in light of the labour force figure, the unemployment rate in the LM was 37.1% - significantly higher than in the Siyanda DM, the Northern Cape and South Africa. The high labour force participation rate, however, means that a significantly higher percentage of people in the Tsantsabane LM than in all the other study areas were looking for jobs.

## 2.5 Economic production and GDP-R

Interpretation of economic impacts requires a sound understanding of the size of the economy and its dynamics in the past. A number of indicators exists that can describe the economy of a region or an area. The most common variables that are used for the analysis include production and Gross Domestic Product per Region (GDP-R). The former represents the total value of sales of goods and services, or the turnover of all economic agents in a region; whilst the latter, using the output approach, means the sum of value added created by all residents within a certain period of time, which is usually a year. The trend at which the GDP-R has been changing in the past is also referred to as economic growth indicator. It is a measure of both the performance of an area and the well-being of the citizens of an area. Faster economic growth than population growth is taken as an indicator of a healthy economy and an improvement in citizens' well-being.

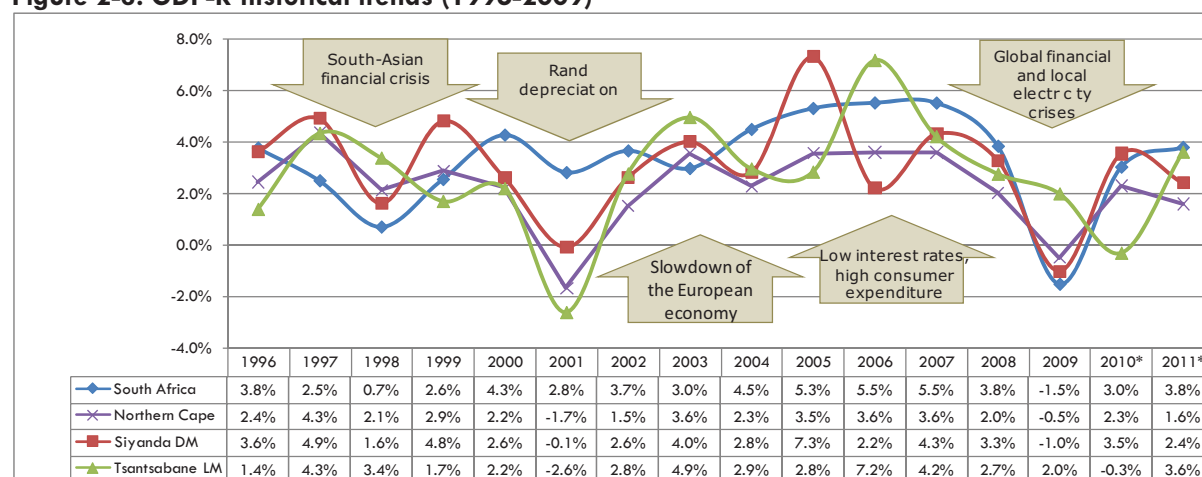
Table 2-5 provides an indication of the current estimated production and GDP-R values in the study areas. It shows that business sales in South Africa are expected to amount to R5 603 billion in 2011, in current prices which equates to R2 530 billion of gross value added. The Northern Cape accounted for about 2.0% of the national GDP-R in 2011, whilst the Siyanda DM and the Tsantsabane LM contributed 22.4% and 3.3% to the provincial economy respectively.

**Table 2-5: Production and GDP-R figures (2011)**

| Study area     | Production (R'ml) |                | GDP-R (R'ml)   |                |
|----------------|-------------------|----------------|----------------|----------------|
|                | Current prices    | CAGR 1995-2010 | Current prices | CAGR 1995-2010 |
| South Africa   | 5 603 076         | 4.6%           | 2 530 484      | 3.3%           |
| Northern Cape  | 104 039           | 3.2%           | 56 341         | 2.3%           |
| Siyanda DM     | 23 380            | 4.2%           | 11 776         | 3.0%           |
| Tsantsabane LM | 3 476             | 3.8%           | 2 106          | 2.8%           |

Source: Quantec, 2011

Figure 2-3 illustrates the dynamics of the study areas and their sensitivity to the global and domestic changes in the economies.

**Figure 2-3: GDP-R historical trends (1996-2009)**


Source: Urban-Econ's calculations based on Quantec, 2011

As illustrated in Figure 2-3, South Africa's economy has been sensitive to the changes on the global and regional arenas. The South Asian financial crisis in 1997-1998, Rand depreciation in 2001, slowdown of the European economy in 2003, and the major global financial and local electricity crises in 2008 all had an influence on the dynamics of the national economy one way or another. It seems that the Rand depreciation in 2001 had a greater effect on the primary and secondary areas, as this were the time when all of them had significantly lower growth rates than South Africa. Fluctuations in the global and regional economies, as well as the spin-off effects of these trends experienced in the country, also affected the growth prospects of provincial, District Municipality's and Local Municipality's economies.

The domestic electricity and global financial crises had a negative impact on the study area's economies in 2009. As illustrated in Figure 2-3, all of the analysed economies contracted, except with the Tsantsabane LM still showing positive growth. This could be explained by the fact that a significant portion of the JT Gaetsewe DM economy comprises of the mining, community and trade industry. The electricity and financial crisis experienced in 2008 had a negative impact on the production volume of the mining industry, therefore the steep decline from 2006. As a result, the size of this industry has shrunk already in 2008. The peak of the aftermath of the global financial crisis reached South Africa in 2009. This coupled with high interest rates and stricter credit policy and had a significant negative impact on the domestic demand. As a result, almost all industries experienced some level of contraction or stagnation which ultimately reduced the demand for their outputs and had a negative impact on their growth. Sectors that continued growing during this period included construction, community and government services, largely due to the investment and activity that took place in preparation for the 2010 World Cup.

The global economy, as well as South Africa's economy, is slowly recovering from the turmoil of the past few years, although it will take a few years before it reaches the level of economic growth that was observed before 2008.

## 2.6 Structure of economies

The structure of the economy provides valuable insight into the dependency of an area on specific sectors and its sensitivity to fluctuations of global and regional markets. Knowledge of the structure and the size of each sector are also important for the economic impact results' interpretation, as it allows the assessment of the extent to which the proposed activity would change the economy, its structure and trends of specific sectors.

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Table 2-6 provides structures of study areas' economies in 2011 illustrating nominal (2011) prices and 2005 prices. It should be noted that the calculation of the structure of the economy in current and constant prices provides different results. This is due to the fact that prices on goods and services do not change proportionally over years. Prices on goods of one sector could grow faster than prices on goods or services in other sectors. The indication of the structure of the economy in basic prices or prices of 2005 as was done in this case illustrates the relative composition of the economy, but excludes the benefits or dis-benefits of that economy that might have been experienced due to price effects. This is why, the presentation of results in nominal prices is also important as it allows the illustration of the economy's structure taking into account the current market prices and therefore the effects thereof on the income or Gross Operating Surplus. The comparison of the structure of the economy in terms of basic and nominal prices also provides valuable insight into the sensitivity of that economy with respect to changes of commodity prices. An economy that generates a significant share of its GDP-R from certain commodities will most likely have a significantly different structure when compared between nominal and basic prices.

**Table 2-6: Structure of the study areas' economies in 2011**

| Sectors                           | South Africa |              | Northern Cape |              | Siyanda DM   |              | Tsantsabane LM |              |              |
|-----------------------------------|--------------|--------------|---------------|--------------|--------------|--------------|----------------|--------------|--------------|
|                                   | 2005 prices  | Nominal      | 2005 prices   | Nominal      | 2005 prices  | Nominal      | 2005 prices    | Nominal %    | Nominal R'ml |
| <b>Primary sector</b>             | <b>8.2%</b>  | <b>11.1%</b> | <b>29.6%</b>  | <b>36.7%</b> | <b>32.3%</b> | <b>40.2%</b> | <b>42.0%</b>   | <b>49.1%</b> | <b>1035</b>  |
| Agriculture, forestry and fishing | 2.3%         | 3.7%         | 6.6%          | 8.9%         | 14.7%        | 19.6%        | 1.3%           | 1.8%         | 37           |
| Mining and quarrying              | 5.8%         | 7.4%         | 23.0%         | 27.7%        | 17.6%        | 20.7%        | 40.6%          | 47.4%        | 997          |
| <b>Secondary sector</b>           | <b>23.2%</b> | <b>23.1%</b> | <b>7.3%</b>   | <b>7.1%</b>  | <b>10.6%</b> | <b>10.0%</b> | <b>5.5%</b>    | <b>5.1%</b>  | <b>107</b>   |
| Manufacturing                     | 17.6%        | 17.2%        | 3.7%          | 3.6%         | 5.7%         | 5.4%         | 2.8%           | 2.7%         | 56           |
| Electricity, gas and water        | 2.2%         | 2.0%         | 1.9%          | 1.7%         | 3.1%         | 2.8%         | 2.0%           | 1.7%         | 36           |
| Construction                      | 3.5%         | 3.9%         | 1.7%          | 1.7%         | 1.8%         | 1.8%         | 0.7%           | 0.7%         | 14           |
| <b>Tertiary sector</b>            | <b>68.6%</b> | <b>65.6%</b> | <b>63.1%</b>  | <b>56.3%</b> | <b>57.1%</b> | <b>49.8%</b> | <b>52.5%</b>   | <b>45.8%</b> | <b>965</b>   |
| Trade                             | 13.7%        | 13.4%        | 12.4%         | 11.3%        | 14.6%        | 12.6%        | 6.5%           | 5.7%         | 119          |
| Transport, storage & comm..       | 10.5%        | 10.7%        | 10.5%         | 10.0%        | 11.8%        | 10.8%        | 17.1%          | 15.7%        | 330          |
| Finance, insurance, & business    | 24.0%        | 22.8%        | 15.2%         | 13.6%        | 10.8%        | 9.4%         | 10.8%          | 9.4%         | 197          |
| Com. and gov. services            | 20.5%        | 18.9%        | 25.0%         | 21.5%        | 20.0%        | 16.8%        | 18.1%          | 15.1%        | 318          |
| <b>TOTAL</b>                      | <b>100%</b>  | <b>100%</b>  | <b>100%</b>   | <b>100%</b>  | <b>100%</b>  | <b>100%</b>  | <b>100%</b>    | <b>100%</b>  | <b>2 106</b> |

Source: Urban-Econ's calculations based on Quantec, 2011

As indicated in Table 2-6, South Africa's economy is a service economy, as the biggest share of its GDP-R is created by tertiary sectors, in particular the finance and business services sector and the community and government services sector. The primary sector that includes agriculture and mining contributes the smallest amount to the national economy, although they are strategically important for ensuring food security in the country and provision of electricity.

The structure of the Northern Cape's economy is entirely different to the composition of the national economy with the tertiary sector accounting for over 60% of its GDP-R and the primary sector playing a prominent role in the economy with just under 30% of its GDP-R. The comparison of the structure of the Northern Cape's economy in basic and nominal terms suggests that price effects have a significant impact on the structure of the economy. This is largely due to the fact that it contains a prominent primary sector, in particular the mining industry, as it is the price of commodities produced by the primary industry that can have a notable effect on the structure of any economy.

The structure of the Siyanda DM's economy is different to that of South Africa, but is quite similar to that of the Northern Cape. It is clear that it is more dependent on the primary and secondary sectors

than that in the province. Because of it, its tertiary sector is smaller than the tertiary sector in the Northern Cape.

The Tsantsabane LM's economy, which generates almost half of its GDP-R from the tertiary sector, also has a different structure with respect to primary and secondary sectors than that of the country's economy. In constant prices, the primary sector accounts for 42% of the provincial GDP-R, but in nominal prices its share is significantly higher which indicates that such an economy would be highly sensitive to fluctuations of prices on commodities, particularly those that are being mined in the area. Whilst its primary sector is vast, its manufacturing sector is small which also indicates that limited processing of the raw materials that are being mined in the area is taking place in this Municipality. Following the biggest sector in the municipality – mining – are the community services sector, transport and finance sector.

## 2.7 Structure of Employment

The employment structure presented largely corresponds with the structure of the economy with the tertiary sector making the largest contribution towards employment creation in all areas under analysis.

- More than two thirds of the people employed in South Africa work in the tertiary sector, in particular the community and government services sector and the trade sector. Agriculture, which accounted for 3% of the national GDP-R in 2011, on the other hand, provided 6.4% of all employment opportunities; whilst the contribution of the mining industry towards the employment in the country was smaller than its contribution towards GDP-R. Nevertheless, both of the sectors are labour-intensive and create a notable number of employment opportunities in the country, particularly in rural areas.
- Employment structure in the Northern Cape is dominated by the number of people who are working in the tertiary sector, specifically in the trade, community and government services. Its secondary sector creates 9.0% of jobs in the Province, whilst its primary sector creates 24.8%.
- Most of the people employed in the Siyanda DM are working in the tertiary sector too, specifically in the community and government services, trade and finance sector. Its secondary sector creates 10.1% of jobs, whilst its primary sector creates 36.9%.
- The employment composition in the Tsantsabane LM is quite similar to that of the Northern Cape with the sectors providing the largest numbers of jobs being the community and government services, mining and quarrying, trade, and finance sectors. The mining sector, which contributes 53.6% to the GDP-R (in nominal prices), provides only 18.2% of employment opportunities in the area. At the same time, the trade, community and government sector's employment contribution is greater than its contribution towards GDP-R.

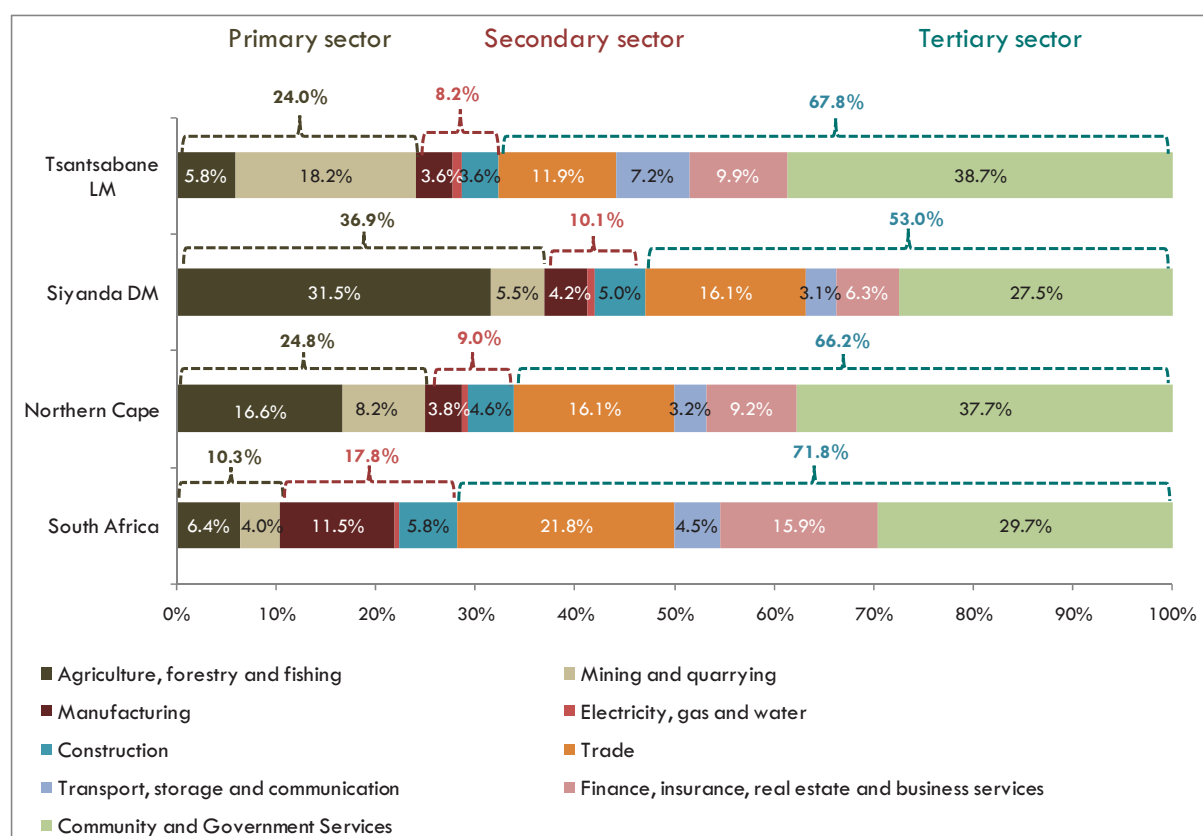
Figure 2-4 illustrates the structure of South Africa, Northern Cape, the Siyanda DM and the Tsantsabane LM economies from an employment perspective.

The employment structure presented largely corresponds with the structure of the economy with the tertiary sector making the largest contribution towards employment creation in all areas under analysis.

- More than two thirds of the people employed in South Africa work in the tertiary sector, in particular the community and government services sector and the trade sector. Agriculture, which accounted for 3% of the national GDP-R in 2011, on the other hand, provided 6.4% of all employment opportunities; whilst the contribution of the mining industry towards the employment in the country was smaller than its contribution towards GDP-R. Nevertheless, both of the sectors are labour-intensive and create a notable number of employment opportunities in the country, particularly in rural areas.
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- The employment composition in the Tsantsabane LM is quite similar to that of the Northern Cape with the sectors providing the largest numbers of jobs being the community and government services, mining and quarrying, trade, and finance sectors. The mining sector, which contributes 53.6% to the GDP-R (in nominal prices), provides only 18.2% of employment opportunities in the area. At the same time, the trade, community and government sector's employment contribution is greater than its contribution towards GDP-R.

**Figure 2-4: Employment structure (2011)**

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Source: Urban-Econ calculations based on Quantec, 2011

## 2.8 Basic service delivery and access to tenure

Access to basic service delivery and shelter are the indicators that allow understanding the standard of living of the households residing in the study areas. Comprehension of the extent to which households in the area have access to water, sanitation and electricity assists in understanding of the communities' plight and their needs. At the same time, knowledge of the types of dwellings that households reside in is valuable in developing a complete profile of the circumstances in which communities are living. All of above creates a baseline against which the potential impacts of the proposed activity could be assessed.

Table 2-7 provides information on the types of dwellings in which households live in the study areas. It indicates that 73% of households in the primary study area were living in formal dwellings and this figure also means that access to formal dwellings in the primary study area was the lowest amongst all study areas analysed. The Tsantsabane LM also had the highest percentage of households living in informal dwellings, such as a shack in a backyard of a formal dwelling or in an informal settlement. This suggests that local communities do require formal housing, for example, the Tsantsabane LM where one out of four households is living in an informal dwelling and that any project that would potentially increase the influx of people into the area could portray up growth of the housing problem, thus housing provision during construction and operation by the project should be received during the EIA phase.

**Table 2-7: Dwelling types (2011)**

| Item              | South Africa  | Northern Cape | Siyanda DM    | Tsantsabane LM |
|-------------------|---------------|---------------|---------------|----------------|
| Formal dwelling   | 80.3%         | 83.2%         | 79.0%         | 73.0%          |
| Informal dwelling | 14.0%         | 10.3%         | 12.8%         | 21.5%          |
| Other             | 5.7%          | 6.5%          | 8.1%          | 3.5%           |
| <b>TOTAL</b>      | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b>  |

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Source: Urban-Econ's calculations based on Quantec, 2011

Table 2-8 provides information on the access of households to electricity, using energy for lighting indicator as a proxy. The information presented in this table suggests that the primary study area's households have the least access to electricity compared to the other study areas. Only 78% of households in the Tsantsabane LM use electricity for lighting compared to 84.2% in the Siyanda DM and 85.8% in the Northern Cape. This information correlates with the situation of access to formal dwellings, as a smaller access to formal residence would suggest a smaller access to electricity.

**Table 2-8: Energy for lighting (2011)**

| Item         | South Africa  | Northern Cape | Siyanda DM    | Tsantsabane LM |
|--------------|---------------|---------------|---------------|----------------|
| Electricity  | 80.8%         | 85.8%         | 84.2%         | 78.3%          |
| Other        | 19.2%         | 14.2%         | 15.8%         | 21.7%          |
| <b>TOTAL</b> | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b>  |

Source: Urban-Econ's calculations based on Quantec, 2011

Table 2-9 shows households' access to water. The situation in this case is quite different to that observed with regard to access to electricity and formal dwellings. Almost 75% of households in the primary study area as well as in the Northern Cape itself have access to water inside their dwellings. This is considerably higher than the 64.3% of households living in South Africa who have access to water inside their dwellings. At the same time, more than 78% of households in the Siyanda DM have access to water from inside their yard. This is not indicative to the rural nature of these regions, where due to the settlement pattern water is quite often provided to the neighbourhood rather than to the dwelling itself. Nevertheless, 4.9% of households in the primary study area and 5.6% of households in the Siyanda DM still have to rely on other sources of water which are not very reliable, such as water vendor, rain water, etc.

**Table 2-9: Access to water (2011)**

| Item                              | South Africa  | Northern Cape | Siyanda LM    | Tsantsabane DM |
|-----------------------------------|---------------|---------------|---------------|----------------|
| Water inside dwelling or a yard   | 64.3%         | 75.0%         | 78.9%         | 74.4%          |
| Water from point outside the yard | 24.9%         | 20.0%         | 15.5%         | 18.7%          |
| Other water access points         | 10.9%         | 5.0%          | 5.6%          | 4.9%           |
| <b>TOTAL</b>                      | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b>  |

Source: Urban-Econ's calculations based on Quantec, 2011

Table 2-10 provides information on access by households to sanitation. It indicates that 75.9% of households in the primary study area have a toilet, which is significantly higher than the 57.7% reported for South Africa. This is also a higher figure than that reported for the Siyanda DM and is also significantly higher than the percentage calculated for the Northern Cape at 72.2% and 67.6% respectively. This again is not indicative to the rural nature of these regions, where households who have access to toilets largely have access to pit toilets. This access to a chemical or flush toilet emphasises their access to water inside dwellings.

**Table 2-10: Access to sanitation (2011)**

| Item                     | South Africa  | Northern Cape | Siyanda DM    | Tsantsabane LM |
|--------------------------|---------------|---------------|---------------|----------------|
| Chemical or Flush Toilet | 57.7%         | 67.6%         | 72.2%         | 75.9%          |
| Pit Toilet               | 25.8%         | 13.9%         | 9.5%          | 2.7%           |
| Bucket system            | 2.7%          | 5.2%          | 6.1%          | 7.6%           |
| Other                    | 13.8%         | 13.3%         | 12.2%         | 13.9%          |
| <b>TOTAL</b>             | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b> | <b>100.0%</b>  |

Source: Urban-Econ's calculations based on Quantec, 2011

### 3. SUMMARY AND POTENTIAL SOCIO-ECONOMIC IMPACTS

The proposed Humansrus CSP facility is to be located in the Tsantsabane LM about 30 kilometres southeast from Postmasburg in the Northern Cape. The Tsantsabane LM comprises of 29 150 people and 7 485 households, thus representing 2.6% of the provincial population. Over the last decade, the size of the municipality from a population perspective has been growing at a slightly quicker rate than that observed in the DM and the rest of the Province. Moreover unlike the trend observed in the province and the rest of the country, its population growth has been increasing and not declining.

Households residing in the Tsantsabane LM have relatively the same level of income as the average household in the Siyanda DM, but it is significantly lower than the average household income in the Northern Cape and even more so in South Africa. A considerably higher percentage of households in the Tsantsabane LM have no income compared to that of the other study areas. This is representative of the fact that the unemployment rate in the LM is worse than the unemployment rate in the Province and country. All of the above suggests that households residing in the Tsantsabane LM have on average lower access to employment opportunities than households in the rest of South Africa.

Households living in the primary study area have poorer access to formal dwellings and electricity than households in the rest of the province and the country. The situation with respect to the access to water and sanitation, however, is different. Compared to the percentage of households with access to water and sanitation in South Africa and in the province, a greater share of households in the Tsantsabane LM has access to water and sanitation services in their dwellings or in a yard.

The labour market in the primary study area comprised of 6 851 employed and 4 044 unemployed people in 2009. It had a bigger labour participation rate (58.2%) than in the secondary and tertiary study areas. This could be explained by the fact that a significant number of working age population in the LM remain active in the labour market, whilst the other areas have a considerable number of people who became discourage job seekers, i.e. people who are not considered to be economically active and are not included in the calculation of the unemployment rate. The fact that a significant number of people remain to be economically active in the municipality compared to their counterparts in the rest of the province could partially explain the large unemployment rate in Tsantsabane, which stands at about 37.5%. The high unemployment rate, though also shows that the local economy is not able to provide employment opportunities for a significant number of local residents, which means that any investment in the local economy that would create new sustainable jobs would be welcome.

The economy of the Municipality is relatively small (R2 billion of GDP-R) and is highly dependent on the mining sector. Since 1996 its average performance was slightly lower than in other study areas under analysis, particularly the Siyanda DM. The dependency of the local economy on the production of the mining sector makes it extremely sensitive to fluctuations of commodity prices and domestic demand for mineral, which in turn is related to the overall performance of the economy. The global recession in 2009 had exactly such an effect on the economy, when the value added of the mining sector dropped by 19%. The above emphasises the need to diversify the local economy by growing

sectors that would be less sensitive to local and global economic changes and that would offer sustainable employment opportunities in other but the mining industry.

From the employment perspective, the sectors that create the majority of jobs in the Municipality are services sectors, such as community and government services, with the mining sector following closely. Given the employment creation targets set by government in its New Growth Path and assuming that it is matched by investment, the economy of the Tsantsabane LM needs to grow at a higher rate in the future than it did in the past few years. In order to achieve these trends, though, a significant investment in the local sectors will need to be made by both private and public sectors. This means that any new development proposed for the area would most likely have a significant positive effect on the structure of the local economy (except if it is mining) and on the ability of the local economy to align itself with the new socio-economic path set up by government.

In light of the socio-economic situation in the primary study area and given the knowledge of the proposed activity, it is expected that the proposed activity, i.e. energy generation using renewable sources, will have a positive impact on the local economy by increasing the local utilities sector and creating new employment opportunities. It will also contribute to the achievement of a number of government objectives related to job creation, diversifying electricity generation capacity in the country, and combating climate change. Moreover, it could potentially stimulate further development of local industries that could become involved in manufacturing components for and maintenance of similar facilities. Through indirect and induced effects it is also expected to have a positive impact on the production volumes of supporting industries and sectors that service consumers. Although if the majority of investment will be spent on purchasing foreign equipment and machinery, the positive impact of the project could be significantly lower than the potential impact.

The establishment of a CSP Plant could result in the discontinuation of the current agricultural activities on the farm and could have a negative impact on the farms surrounding it. The actual extent of this effect will still need to be determined. Most importantly, though, the net effect of the project will need to be estimated during the socio-economic impact assessment. This refers to the comparison of the socio-economic impacts of the proposed activity with the socio-economic effects of the current activity on site.

From a social perspective, creation of new employment opportunities will most likely have a positive impact on the standard of living of the affected households. The project though could also create a number of negative socio-economic effects, particularly during construction. These include potential increase of crime in the area, increase of health concerns and potential deterioration of health due to noise and dust in the area.

Overall, the potential socio-economic impacts that could be predicted at this stage and that will need to be investigated in the specialist study include:

- Strategic macro-economic impacts:
  - Assistance in achieving government objectives;
  - Impact on balance of payment due to possibility that certain equipment and machinery will be imported;
  - Provision of electricity without putting additional pressure on water resources;
  - Reduced emissions and potential to trade in carbon credits, and
  - Potential to establish a new manufacturing industry.
- During the construction phase:
  - Temporary increase in production and GDP-R in industries supporting the construction;
  - Temporary employment creation at the construction site and supporting industries;

- 0 Temporary increase in government revenue due to the establishment of the plant;
  - 0 Permanent loss of production created by the current agricultural activities;
  - 0 Permanent loss of jobs associated with the existing agricultural activities on site;
  - 0 Influx of job seekers and associated crime concerns;
  - 0 Possible negative health impacts associated with migrants, and
  - 0 Temporary increase in households' income levels.
- During the operational phase:
  - 0 Increase in production and GDP-R due to the plant's operations;
  - 0 Creation of sustainable employment opportunities at the plant and supporting industries;
  - 0 Increase in government revenue;
  - 0 Skills development;
  - 0 Improvement of living standards of positively affected households (thought employment);
  - 0 Increase in households' income levels;
  - 0 Change in standards of living of the directly affected households, and
  - 0 Impact on local tourism.



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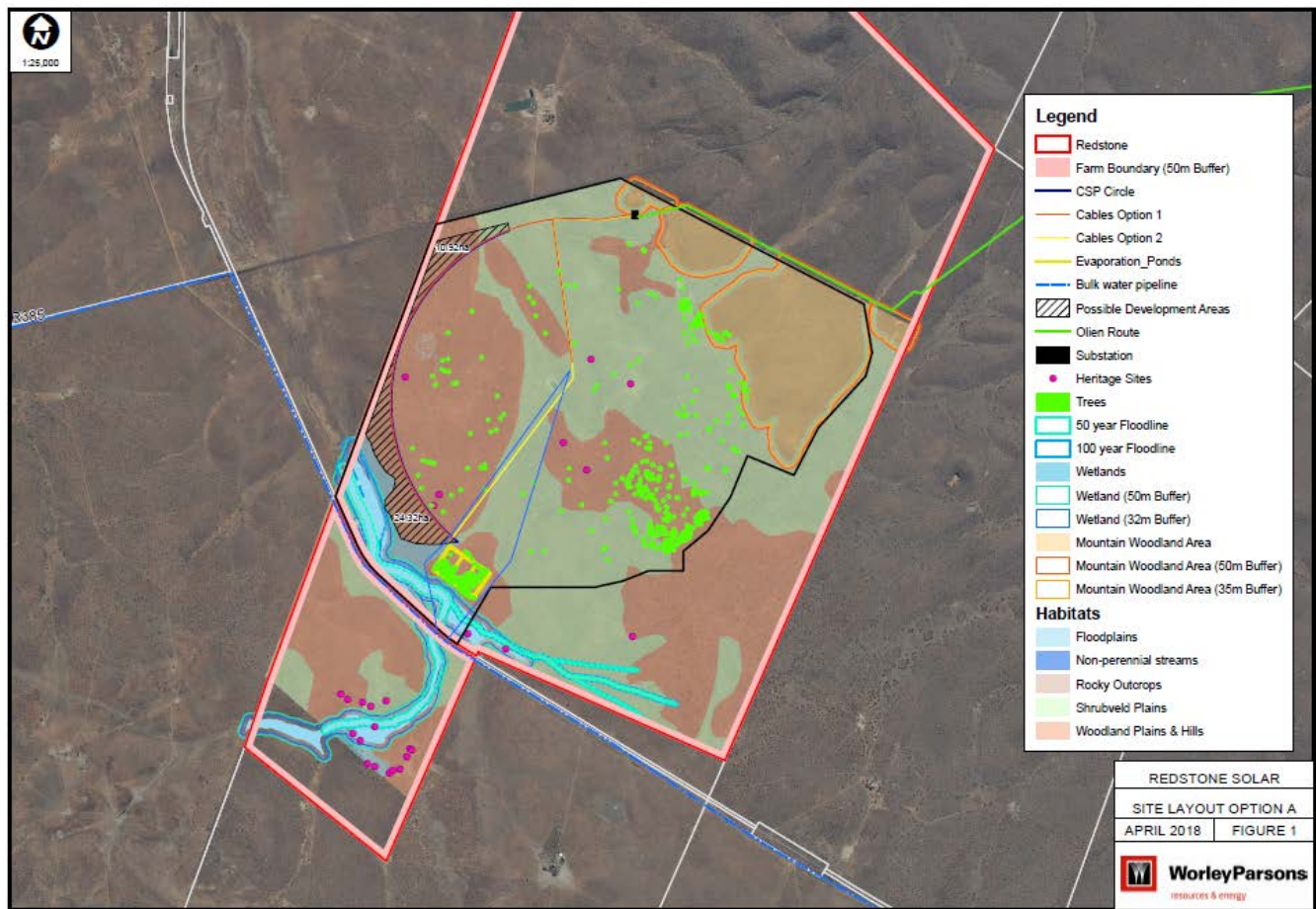
<sup>1</sup> The project was authorised under the National Environmental Management Act 107 of 1998 (NEMA) by the Department of Environmental Affairs (DEA) Ref. Nr 12/12/20/2316 (AM7)

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

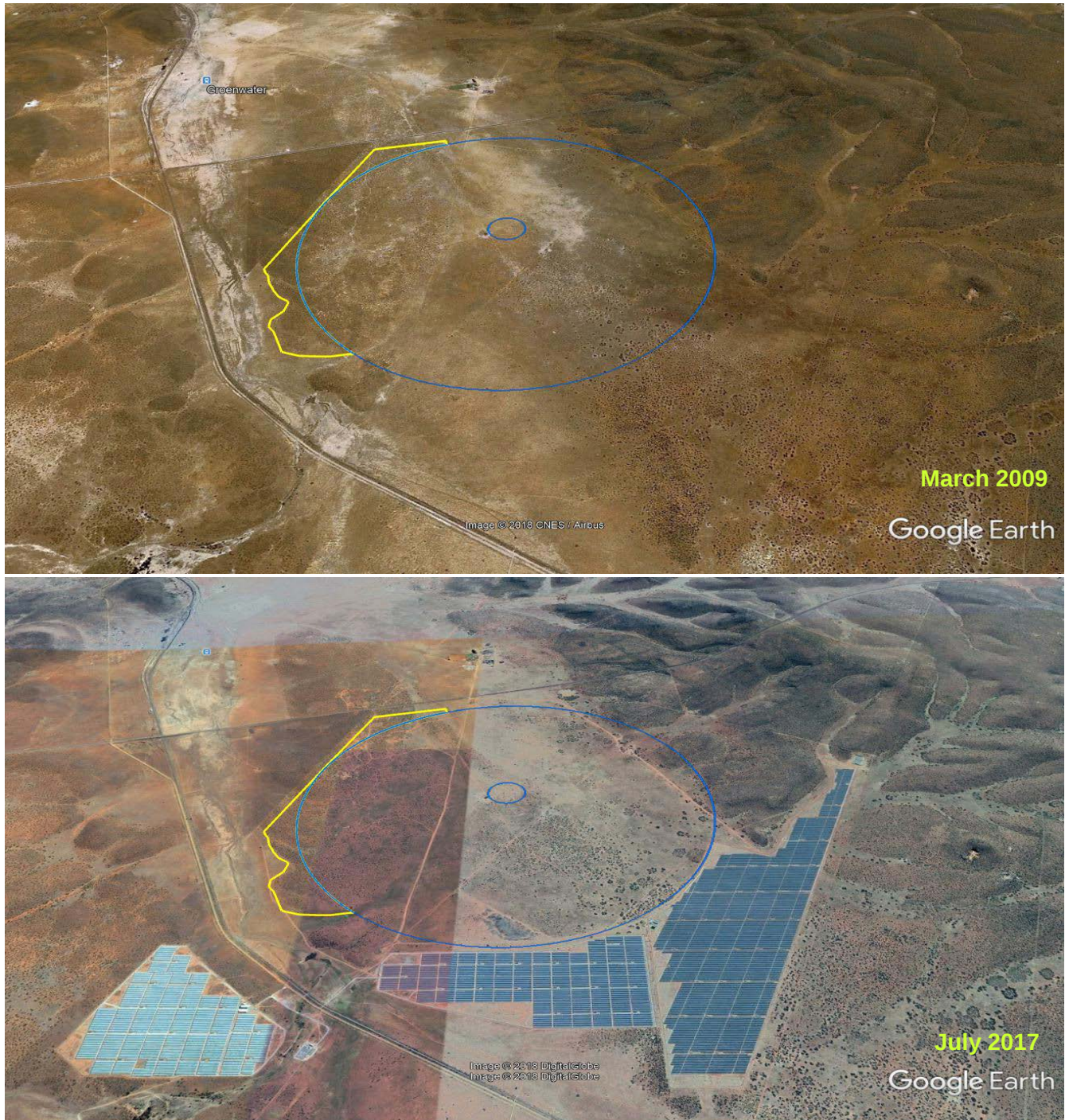
## 1.5 Assumptions and implications

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:
  - o Value of the development, including investment, employment, presence of construction workers on site, and household benefits
  - o Footprint of the development
  - o Height (and as a result visual effect) of the development
  - o 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:

- o 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.
- o 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:
  - o Impact on production and Gross Domestic Product (GDP)
  - o Impact on national government revenue
- During operation:
  - o Impact on production and GDP
  - o Impact on national and local government revenue
- During operation:
  - o Impact on business revenue and resource/material recovery
  - o 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |           |             |              |
| Activity:            | Investment into the development and construction of the Solar PV Facility                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |           |             |              |
| Impact:              | <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> |        |           |             |              |
| Significance rating: | Duration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Extent | Magnitude | Probability | Significance |
| Pre-Mitigation       | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4      | 6         | 4           | 44           |
| Post-Mitigation      | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4      | 6         | 4           | 44           |
| Mitigation Measures: | <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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |           |             |              |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|-------------|--------------|
| Activity:            | Investment into the development and construction of the Solar PV Facility                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |           |             |              |
| Impact:              | <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> |        |           |             |              |
| Significance rating: | Duration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Extent | Magnitude | Probability | Significance |
| Pre-Mitigation       | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4      | 4         | 4           | 36           |

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

| Phase: Operation            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                  |                    |                     |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------|--------------------|---------------------|
| <b>Aspect:</b>              | <b>Type: Socio-economic</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                  |                    |                     |
| <b>Activity:</b>            | <b>Expenditure on operation of the proposed PV Power Project</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                  |                    |                     |
| <b>Impact:</b>              | <b>Impact on production and Gross Domestic Product (GDP)</b><br><br><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<br><br><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<br><br><b>Cumulative Impacts:</b> Growth of the domestic economy<br><br><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             | 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>   | <b>Impact on national and local government revenue</b><br><br><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</p> <p><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</p> <p><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</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             | 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>            | Expenditure on decommissioning activities and recovery of valuable resources through recycling (i.e. copper cables, steel and aluminium structures, storage tanks, pipes, etc.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |                  |                    |                     |
| <b>Impact:</b>              | <p>Impact on production, Gross Domestic Product (GDP) and metallic and non-metallic materials inventory</p> <p><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</p> <p><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</p> <p><b>Cumulative Impacts:</b> Improved resource utilisation</p> <p><b>Residual Impacts:</b> None expected</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 | 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> |   |   |   |           |

| <b>Aspect:</b>              | <b>Type: Socio-economic</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |                  |                    |                     |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------|--------------------|---------------------|
| <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**
  - o Probability of occurrence (how likely is it that the impact may occur?)
  - o Duration of occurrence (how long may it last?)
- **Severity**
  - o Magnitude (severity) of impact (will the impact be of high, moderate or low severity?)
  - o 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).

Date of Birth: 11 September 1980  
 Designation: Manager: Innovation & Sustainable Development  
 Profession: Senior Development Economist  
 Specialisation: Sustainable Development Specialist  
 Years within Firm: 12 Years  
 Nationality: Russian/SA Citizen  
 Years of Experience: 12 Years  
 HDI Status: White Female



## Education:

|                                           |                                 |
|-------------------------------------------|---------------------------------|
| University of Pretoria - 2011             | MSc (Technology Management)     |
| University of Pretoria - 2007             | BScHons (Technology Management) |
| Parkland College, USA - 2004              | Computer Integrated Accounting  |
| Parkland College, USA - 2004              | Independent Business            |
| Parkland College, USA - 2003              | Intermediate Accounting         |
| Parkland College, USA - 2003              | Records Management              |
| Parkland College, USA - 2003              | Financial Accounting            |
| Parkland College, USA - 2003              | Managerial Accounting           |
| Nizhny Novgorod University, Russia - 2002 | BComHons (Economics)            |

## Professional Membership:

SAPOA - Urban-Econ Development Economists (Pty) Ltd

| Language Proficiency: | Reading   | Writing   | Speaking  |
|-----------------------|-----------|-----------|-----------|
| English               | Excellent | Excellent | Excellent |
| Russian               | Excellent | Excellent | Excellent |

## Key Qualification:

Elena Broughton completed her BComHons in Economics in Russia, at Nizhny Novgorod State University in 2002 specialising in regional economics. At the same time, she completed an additional degree as Translator/Interpreter in Professional Orientated Communication. After completion of her Honours degree in Economics, Elena moved to the USA and stayed there for 1.5 years. During her stay in the USA, she completed a number of Accounting and Business courses at Parkland College, Illinois. In 2007, she obtained her BScHons in Technology Management (Cum Laude) at the University of Pretoria and later received her MSc in Technology Management (2011) from the same university.

Elena Broughton is a senior professional at Urban-Econ and a manager of the Innovation & Sustainable Development Unit. She has an extensive knowledge in various fields of economic development, including policy evaluation, feasibility studies, impact assessments, investment strategy formulation, strategic decision analysis, and monitoring and evaluation. She is experienced in developing input-output and SAM-based models, as well as development and application of other econometric techniques. Elena has a proven track record of managing complex multidisciplinary projects and a team of sub-consultants.

## Employment History:

|                |                                   |
|----------------|-----------------------------------|
| 2004 - current | Urban-Econ: Development Economist |
|----------------|-----------------------------------|

## Relevant experience:

- West Rand Tailings Retreatment Project Economic Impact Assessment
- Palmietkuilen Mining Project near Springs Economic Impact Assessment
- Thabametsi IPP Coal-fired Power Station near Lephalale Socio-Economic Impact Assessment
- Thabametsi Coal Mine Sustainable Development Investigation and Economic Impact Assessment
- Doornhoek Fluorspar Project, near Zeerust Socio-Economic Impact Assessment

- Colenso Coal Mine and Coal-Fired Power Station Socio-Economic Impact Assessment. Kwazulu-Natal
- Waterberg Coal-Powered Power Stations Economic Impact Study, Limpopo
- Socio-Economic Impact Assessment for the Construction of an Attenuation Pond in Louwlandia, the Tshwane Metro
- West Rand Tailings Retreatment Project Economic Impact Assessment
- Biotherm Eureka and Aleta Wind Energy Facilities Socio-Economic Impact Assessment
- Mafube Coal Mine Expansion Sustainable Development Investigation and Economic Impact Assessment
- Sishen Mine Waste Dumps Macro-Economic and Economic Impact Assessment
- Eskom Coal 1 and Coal 2 Economic Impact Assessments, Mpumalanga
- Eskom: Ariadne-Eros Transmission Line Economic Impact Assessment
- Eskom CSP Macro-Economic Impact Assessment
- Eskom Ingula Pumped Storage Scheme Regional Economic Impact Assessment
- Eskom Wind Energy Facility 1 (WEF1) Macroeconomic and Regional Impact Assessment
- Eskom Sere Wind (WEF1) Macro-Economic Impact Assessment
- Eskom Kendal And Lethaba EIA: Economic Impact Assessments
- BRMO Gloria Mine Sinter Plant and Mine Expansion Economic Impact Assessment
- Leeudoringstad 8MW Solar PV Socio-Economic Basic Assessment
- Wildebeestkuil 8MW Solar PV Socio-Economic Basic Assessment
- Volspruit Mine Socio-Economic Impact Assessment
- Wag'nbielkiespan PV Solar Energy Facility near Boshof, the Free State Province (75 MW PV solar facility)
- Braamhoek Pumped Storage Scheme Impact Analysis
- Saldanha Bay Separation Plant Economic Impact Assessment
- Zandkopsdrift Rare Earth Elements (REE) Project Economic Impact Assessment
- Balmoral Economic Impact Assessment
- Mafube Nooitgedacht and Wildfontein EIA/EMP Sustainable Development Investigation Study
- De Hoop Dam Economic Impact Monitoring Framework
- N3 Highway Economic Impact Assessment
- The Mandela Bay Precinct Economic Impact Assessment
- Harrismith Logistics Hub Impact Assessment
- Megamall Economic Impact Assessment
- Coega Ridge Economic and Social Impact Assessments
- Amanzi Economic & Social Impact Assessment
- Socio-Economic Impact Assessment of the Proposed New Eskom Power Stations in the Witbank Area and Northern Free State
- Arriesfontein Solar Energy Park near Danielskuil in the Northern Cape
- Humansrus Solar Energy Facility near Postmasburg in the Northern Cape (100 MW CSP-Tower facility)
- Rooipunt Solar Energy Park near Upington in the Northern Cape (100 MW CSP-Tower facility and 215 MW PV solar facility)
- Farm 198 PV Solar Energy Facility north of Kimberley in the Northern Cape (210 MW PV solar facility)
- Wag'nbielkiespan PV Solar Energy Facility near Boshof, the Free State Province (75 MW PV solar facility)

## Countries of Work Experience:

- South Africa
- Russia
- Zambia
- Namibia

## Contact Details:

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## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

|  |
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|  |
|  |
|  |

### DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

|                        |                         |
|------------------------|-------------------------|
|                        | (For official use only) |
| File Reference Number: | 12/12/20/ or 12/9/11/L  |
| NEAS Reference Number: | DEA/EIA                 |
| Date Received:         |                         |

Application for integrated environmental authorisation and waste management licence in terms of the-

- (1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and
- (2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

### PROJECT TITLE

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

|                                      |                                                                   |       |                 |
|--------------------------------------|-------------------------------------------------------------------|-------|-----------------|
| Specialist:                          | Socio-economic specialist: Urban-Econ Development Economists      |       |                 |
| Contact person:                      | Elena Broughton                                                   |       |                 |
| Postal address:                      | 1st Floor, Lake View Office Park, 137 Muckleneuk Street, Brooklyn |       |                 |
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| Professional affiliation(s) (if any) | SAPOA                                                             |       |                 |

|                     |  |       |  |
|---------------------|--|-------|--|
| Project Consultant: |  |       |  |
| Contact person:     |  |       |  |
| Postal address:     |  |       |  |
| Postal code:        |  | Cell: |  |
| Telephone:          |  | Fax:  |  |
| E-mail:             |  |       |  |

4.2 The specialist appointed in terms of the Regulations\_

I, Elena Broughton, declare that –

General declaration:

I act as the independent specialist in this application;  
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;  
I declare that there are no circumstances that may compromise my objectivity in performing such work;  
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;  
I will comply with the Act, Regulations and all other applicable legislation;  
I have no, and will not engage in, conflicting interests in the undertaking of the activity;  
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;  
all the particulars furnished by me in this form are true and correct; and  
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



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Signature of the specialist:

Urban-Econ Development Economists

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Name of company (if applicable):

26 April 2018

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Date: