SOCIAL IMPACT ASSESSMENT
EIA REPORT

PROPOSED WOODHOUSE SOLAR 2 PV FACILITY AND ASSOCIATED INFRASTRUCTURE NEAR VRYBURG, NORTH WEST PROVINCE

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EXECUTIVE SUMMARY

Savannah Environmental (Pty) Ltd has been appointed by Genesis Woodhouse Solar 2 (Pty) Ltd, to undertake an Environmental Impact Assessment (EIA) for the construction of a commercial photovoltaic (PV) solar energy facility (known as the Woodhouse Solar 2 PV Facility) as well as all associated infrastructure. The proposed PV facility is to be located on the Remaining Extent of Farm Woodhouse 729, situated approximately 10 km south east of Vryburg. The proposed PV facility falls under the jurisdiction of the Naledi Local Municipality and within the greater Dr Ruth Segomotsi Mompati District Municipality in the North West Province. The contracted capacity of the proposed solar energy facility will be up to 100MW.

The Social Impact Assessment (SIA) was undertaken by Candice Hunter of Savannah Environmental. The purpose of the report is to assess the potential social impacts associated with the proposed PV facility and to recommend management measures to reduce / avoid the negative social impacts and enhance the positive social impacts associated with the proposed PV facility. This report contains the findings of the SIA for the EIA process for the proposed Woodhouse Solar 2 PV Facility.

Legislation and Guidelines

The review of the relevant planning and policy documents was undertaken as a part of the SIA process. The key documents reviewed included:

National Policies:

- The Constitution of the Republic of South Africa (Act 108 of 1996)
- The National Environmental Management Act (107 of 1998) (NEMA)
- The National Energy Act (34 of 2008)
- National Development Plan 2030
- National Climate Change Response Green Paper (DEA, 2010)
- White Paper on Energy Policy of the Republic of South Africa (1998)
- White Paper on Renewable Energy of the Republic of South Africa (2003)
- National Integrated Resource Plan South Africa (2010-2030)
- Strategic Infrastructure Projects (SIPs)

Provincial Policies:

- North West Province Spatial Development Framework (SDF) - North West Environmental Management Series 7 (2008)
- North West Provincial Growth and Development Strategy (PGDS) (2004- 2014)

Local and District Policies:

- Dr Ruth Segomotsi Mompati District Municipality (DRSMDM) Integrated Development Plan (IDP) (2015/2016)
- Naledi Local Municipality (NLM) Integrated Development Plan (2015/2016)

Solar Energy Policies:

- Solar Energy Technology Roadmap (2013)

» Renewable Energy Development Zones (REDZs)

Summary of the socio-economic profile of the broader study area

Regional Context:

The location of the Woodhouse Solar 2 PV Facility falls under the jurisdiction of the Naledi Local Municipality (NLM) and within the greater Dr Ruth Segomotsi Mompati District Municipality (DRSMDM) in the North West Province.

» North West Province:
  - The North West Province is situated in the north of South Africa.
  - The Province shares the boundaries with Free State, Limpopo and Gauteng Provinces, and is the gateway to Botswana.
  - The Province covers an area of ~104 882km² and has a population of approximately ~3 509 953 people. Much of the Province consists of flat areas of scattered trees and grassland.
  - The North West Province is predominantly a rural Province with the main economic activities being mining and agriculture.
» Dr Ruth Segomotsi Mompati District Municipality (DRSMDM):
  - The DRSMSM is one of the four districts of the North West Province.
  - The seat of district is the town of Vryburg.
  - The DRSMDM has a population of ~439 637 people which is 13.2% of North West Province's population. Majority of the population speak Setswana (Census, 2011).
  - The DRSMDM is South Africa's largest beef producing district, with Hereford cattle being the most popular.
  - The settlement pattern in the DRSMDM is fragmentary with small, low-intensity urban areas scattered throughout and surrounded by vast rural areas. The more urban areas, or towns, comprise of higher density settlements with mainly a residential character, except for the only regional urban center or node, being Vryburg, which has a mix of land uses, varying from residential, retail, institutional to manufacturing and industrial.

Local Context

Naledi Local Municipality:

» The NLM is situated in the DRSMDM in the North West Province. The NLM covers an area of approximately ~7 264 km² and is divided into nine wards.
» The NLM is separated into the following main places, namely, the town of Vryburg, Huhudi Township, Colridge Township, Stella, Devondale and Dithakwaneng village.
» Agriculture and hunting are the strongest contributors to the municipality's economy, jointly responsible for 21% of employment.
» The NLM has a strong beef breeding industry. Most of the NLM income is derived from the agricultural sector.
» The greatest social problems in the NLM are illiteracy, poverty and lack of basic service infrastructure. The NLM has a declining economy. The income distribution is

distorted in the NLM to the disadvantage of the less economically secured people, who also represents the majority of the municipal area. Poor households are a result of a lack of wage income, either due to unemployment or low-paying jobs. Access to basic services such as electricity, toilets and piped water is also closely correlated with poverty.

Direct area of influence:

» The Department of Energy (DoE) indicates that the Renewable Energy Independent Power Producer Procurement (REIPPP) Programme offers great potential for positive socio economic outcomes- listed as job creation, local ownership, socio-economic development and enterprise development. All of which has to happen within 50 km of the project site. The settlements within the project's direct area of influence (within a 50km radius) include Vryburg, Huhundi, Stella and Schweizer-Reneke.
» The development of the PV facility will be associated with economic benefits including economic growth and development (economic opportunities such as jobs and expenditure in the local area). Negative dimensions of impacts such as an influx of jobseekers and pressure on the provision of basic services is assessed in this SIA.

Indirect areas of influence:

The indirect areas of influence extend to all areas that will be indirectly affected by the proposed PV facility. These include road users that use the R34 on a frequent basis as part of their daily or weekly movement patterns. Construction vehicles and trucks may utilise these roads during the construction phase which will increase the traffic and may increase the wear and tear on these roads. The proposed PV facility will also have an indirect effect on the town's local residents; with a possible influx of in-migrants and possible growth in the local economy.

Immediate area of influence:

The proposed PV facility is located on the Remaining Extent of Farm Woodhouse 729. Majority of the land surrounding the PV facility comprises large open spaces and agricultural areas (livestock and minor game farming).

Social Impact Assessment

The environmental assessment framework for the assessment of impacts and the relevant criteria were applied to evaluate the significance of the potential social impacts. A summary of the potential positive and negative social impacts identified in the SIA for the construction and operation phase of the proposed PV facility are presented in Table 1 and Table 2 below. Table 3 presents the cumulative impacts associated with the proposed PV facility.

Table 1: Summary of social impacts during construction phase

CONSTRUCTION PHASE

Impact	Significance without Mitigation/ enhancement	Significance with Mitigation/ enhancement
Positive Impacts		
Direct employment and skills development	Medium (36)	Medium (44)
Economic multiplier effects	Medium (30)	Medium (36)
Negative Impacts		
Influx of jobseekers	Low (24)	Low (18)
Impacts on daily living and movement patterns (Traffic Impacts)	Medium (30)	Low (16)
Safety and security risks	Low (27)	Low (14)
Nuisance impact (noise and dust)	Low (15)	Low (12)

Table 2: Summary of social impacts during operation phase

OPERATION PHASE		
Impact	**Significance without Mitigation/ enhancement**	**Significance with Mitigation/ enhancement**
Positive Impacts		
Direct employment and skills development	Medium (40)	Medium (48)
Development of clean, renewable energy infrastructure	Medium (40)	Medium (40)
Benefits associated with REIPPP socio-economic development plans and community trust	Medium (30)	Medium (48)
Negative Impacts		
Visual and sense of place impacts	Medium (30)	Low (24)
Impacts associated with the loss of agricultural land	Low (28)	Low (28)

Table 3: Summary of cumulative social impacts

CUMULATIVE IMPACTS		
Cumulative Impact	**Overall impact of the proposed project considered in isolation**	**Cumulative impact of the project and other projects in the area**
Positive Cumulative Impacts		

Cumulative impacts from employment, skills and business opportunities	Low (27)	Medium (39)
Negative Cumulative Impacts		
Cumulative impacts with large-scale in-migration of people	Low (18)	Medium (39)
Cumulative impacts on the sense of place and landscape	Low (24)	Medium (36)

From a social perspective it is concluded that the development of the PV facility is supported, but that mitigation measures should be implemented and adhered to. Positive and negative social impacts have been identified. The assessment of the key issues indicated that there are no negative impacts that can be classified as fatal flaws and which are of such significance that they cannot be successfully mitigated. Positive impacts could be enhanced by implementing appropriate enhancement measures and through careful planning. Based on the social assessment, the following general conclusions and findings have been made:

» The potential negative social impacts associated with the construction phase are typical of construction related projects and not just focussed on the construction of the PV facility (these relate to influx of non-local workforce and jobseekers, intrusion and disturbance impacts, safety and security). These impacts could be reduced with the implementation of the mitigation measures proposed.
» Employment opportunities will be created in the construction and operation phase and the impact is rated as positive even if only a small number of individuals benefit in this regard.
» The proposed project could assist the local economy in creating entrepreneurial development, especially if local businesses could be involved in the provision of general material and services during the construction and operation phases.
» Capacity building and skills training among employees are critical and would be highly beneficial to those involved, especially if they receive portable skills to enable them to also find work elsewhere and in other sectors.
» The proposed PV facility represents an investment in infrastructure for the generation of clean, renewable energy, which, given the increased awareness of climate change and the need for additional electricity supply, represents a positive social benefit for society as a whole.

Recommendations

Based on the social assessment, the following recommendations are made:

» A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a

designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained by the Contractor and monitored by the ECO to record all complaints and queries relating to the project and the action taken to resolve the issue.

» In terms of employment related impacts, it is important to consider that job opportunities for the unskilled and semi-skilled in the broader study area could create competition among the local unemployed. Introducing an outside workforce will therefore most likely worsen local endeavours to obtain jobs and provoke discontent as well as put pressure on the local services available. It is imperative that local labour be sourced, wherever possible, to ensure that benefits accrue to the local communities. Efforts should be made to involve local businesses during the construction activities where possible. Local procurement of labour and services/products would greatly benefit the community during the construction and operation phases of the project.
» Local procurement of services and equipment should take place where possible in order to enhance the multiplier effect. This would serve to mitigate other subsequent negative impacts such as those associated with the inflow of outsiders to the area, the increased pressure on the infrastructure and services in the area, as well as the safety and security concerns.
» Involve the community in the process as far as possible (encourage co-operative decision making and partnerships with local entrepreneurs).
» Implement mitigation measures to reduce and avoid negative impacts.
» Employ mitigation measures to minimise the dust pollution, damage to existing roads, fences and/ gates.
» Safety and security risks should be taken into account during the planning/ construction phase of the proposed project. Access control, security and management should be implemented to limit the risk of crime increasing in the area.

Overall Conclusion

The proposed PV facility and associated infrastructure is unlikely to result in permanent damaging social impacts. From a social perspective it is concluded that the project could be developed subject to the implementation of the recommended mitigation measures and management actions contained in the SIA report.

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List of Abbreviations

CNA	Community Needs Assessment
CSP	Concentrated Solar Power
DoE	Department of Energy
DEA	Department of Environmental Affairs
DGDS	District Growth and Development Strategy
DM	District Municipality
EAP	Economically Active Population
ED	Enterprise Development
EIA	Environmental Impact Assessment
EMF	Environmental management Framework
EMPr	Environmental Management Programme
EMZ	Environmental Management Zone
EPC	Engineering, Procurement and Construction
GDP	Gross Domestic Product
HA	Hectares
HD	Historically Disadvantaged
HDSA	Historically Disadvantaged South Africans
IDP	Integrated Development Plan
IPP	Independent Power Producer
NLM	Naledi Local Municipality
KPA	Key Performance Area
kV	Kilovolts
LED	Local Economic Development
LM	Local Municipality
MW	Megawatt
NEMA	National Environmental Management Act
NSSD	National Strategy for Sustainable Development
PV	Photovoltaic
PSDF	Provincial Spatial Development Framework
PGDS	Provincial Growth and Development Strategy
SED	Socio-Economic Development
SEMP	Strategic Environmental Management Plan
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SIPs	Strategic Infrastructure Projects
VIA	Visual Impact Assessment
DRSMDM	Dr Ruth Segomotsi Mompati District Municipality
WWF	World Wide Fund

1. INTRODUCTION

Savannah Environmental (Pty) Ltd has been appointed by Genesis Woodhouse Solar 2 (Pty) Ltd, to undertake an Environmental Impact Assessment (EIA) for the construction of a commercial photovoltaic (PV) solar energy facility (known as the Woodhouse Solar 2 PV facility) as well as all associated infrastructure. The PV facility is proposed to be located on the Remaining Extent of Farm Woodhouse 729, situated approximately 10 km south east of Vryburg. The proposed site falls under the jurisdiction of the Naledi Local Municipality and within the greater Dr Ruth Segomotsi Mompati District Municipality in the North West Province. The contracted capacity of the proposed solar energy facility will be up to 100MW.

This Social Impact Assessment (SIA) was undertaken by Candice Hunter of Savannah Environmental as part of the EIA process.

1.1. Social Impact Assessment (SIA)

SIA is described as "the process of assessing or estimating, in advance, the social consequences that are likely to follow from specific policy actions or project developments, particularly in the context of appropriate national, state, or provincial environmental policy legislation" (Becker et al, 2003). By social impacts meaning the consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalise their cognition of themselves and their society (National Maritime Fisheries Service, 1994).

SIA is a methodology or instrument used by social assessment practitioners to determine the social impacts of a project and to provide ways to mitigate and monitor the potential impacts (Vanclay, 2003). The SIA is divided into a number of phases however the public consultation is a crucial step in the preparation of an SIA. SIA is concerned with the human dimensions of the environment, this meaning that;

> *"SIA is the process of analysing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment (Vanclay, 2003: 2)."*

The National Environmental Management Act (NEMA) (Act 107 of 1998) sets out a number of principles which underpin environmental management in South Africa.

A number of these principles relate to the social dimension of sustainable development and public process requirements such as transparency, accountability, democracy and environmental justice. The following principle outlines the basis for a Social Impact Assessment:

> *Environmental management must place people and their needs at the; forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*

More specifically, the social, economic and environmental impacts of activities must be considered and assessed. SIA is a useful planning tool that can assist the project proponent to conceptualise and implement a project in a manner which would see the identified negative social impacts addressed through avoidance or mitigation and the positive impacts realised and optimised. It also allows the community to anticipate, plan for, and deal with the social changes once they come to effect. In this sense the SIA is an indispensable part of the EIA, the Environmental Management Programme (EMPr) and any participative activity (E.g. Community involvement in mitigation and monitoring during planning and implementation). The purpose of an SIA report is to provide baseline information regarding the social environment and to identify possible social impacts that may come about as a result of a project. The report highlights the most likely associated social impacts to occur from the proposed project and provides methods to aim towards emphasising positive impacts and avoiding, reducing or mitigating negative identified impacts.

1.2. Terms of Reference

The main aim of the SIA report is to assess the potential social impacts that may arise from the proposed PV facility, and to recommend the most suitable mitigation/enhancements measures from a social perspective. The purpose of the study is:

» To provide baseline information describing the social environment affected by the proposed PV facility
» To identify, describe and assess possible social risks/fatal flaws and social impacts that may come about as a result of the proposed PV facility (in terms of the construction, operation and decommissioning phases of the project);and
» To suggest ways in which these impacts can be mitigated or enhanced, aiming at maximising opportunities and avoiding and or reducing negative social impacts, including cumulative impacts.

1.3. Specialist Details

The SIA report was prepared by Candice Hunter of Savannah Environmental, a SIA specialist with a Master's degree in Environmental Management and an advanced certificate in SIA from the University of Johannesburg. The SIA report has been reviewed by Dr Neville Bews, an independent external SIA specialist who has consulted in the SIA field for over 10 years and has a Ph.D in Sociology (see Appendix D).

1.4. Declaration of Independence

A signed declaration of independence and CV for Candice Hunter of Savannah Environmental (Pty) Ltd is attached in Appendix D.

1.5. Project Overview

Project background and description:

The project is to be developed as a stand-alone project by Genesis Eco-energy Developments. Genesis Woodhouse Solar 2 (Pty) Ltd (the Special Purpose Vehicle (SPV)) has been established as the applicant for the project.

The PV facility will include the following infrastructure:

» Arrays of single axis PV tracking panels or fixed tilt PV panels with a capacity of up to 100MW.
» Mounting structures to support the PV panels.
» On-site inverters to convert the power from a direct current to an alternating current and a substation to facilitate the connection between the solar energy facility and the Eskom electricity grid.
» A new 132kV power line between the on-site substation and the Eskom grid connection point. Four alternatives are being considered for the grid connection:
» Alternative 1: A direct connection to the authorised Eskom Bophirima Substation to be constructed within the northern portion of the affected property (i.e. the Remaining Extent of the farm Woodhouse 729);
» Alternative 2: A direct connection to the existing Woodhouse 88/22kV Substation located north of the boundary of the affected property;
» Alternative 3: A turn-in turn-out connection to the existing Delareyville Munic / Vryburg 1 88kV Feeder located along the northern boundary of the affected property; and

» Alternative 4: A turn-in turn-out connection to the authorised 132kV Eskom Bophirima–Mookodi power line to be constructed by Eskom[1].
» Cabling between the project components, to be laid underground where practical.
» Offices and workshop areas for maintenance and storage.
» Temporary laydown areas.
» Internal access roads and fencing around the development area

The purpose of the proposed PV facility will be to evacuate the generated power into the Eskom national electricity grid. The project is proposed to be bid into the Department of Energy's (DoE) Renewable Energy Independent Power Producers Procurement (REIPPP) Programme.

Alternatives being assessed

A pre-feasibility analysis and site identification process was undertaken by Genesis Woodhouse Solar 2 (Pty) Ltd. By undertaking a technical feasibility study which considered favourable climatic conditions (solar renewable energy facilities are directly reliant on average solar radiation values for a particular area), access and capacity of the electricity grid, accessibility of the study area, and local site topography, an ideal site has been identified (Farm Woodhouse RE/729) for the establishment of the solar energy facility by the project developer. No alternative sites (broader study area) were proposed for the assessment. There are however two site layout alternatives being considered that are located within Farm Woodhouse RE/729. The preferred site layout is located within the south west corner of the farm and the alternative site layout is located in the centre of farm.

A viable grid connection point to the Eskom national electricity grid needs to be established in order to evacuate the generated solar energy into the national electricity grid. Four grid connection alternatives are being considered and includes the following:

» Alternative 1: will be the construction of a 132kV power line between the on-site facility substation and the authorised Eskom Bophirima Substation to be constructed in the northern portion of the project site. The 132kV power line will start on the western boundary of the on-site substation and will extent towards the west to connect to the Eskom Bophirima Substation. The length of the power line required to be constructed for this connection will be ~160m.
» Alternative 2: includes the construction of a 132kV power line between the on-site substation and the existing Woodhouse 88/22kV Substation. The

[1] In the event that Eskom is unable to complete the construction of the proposed 132kV Eskom Bopirima-Mookodi Overhead Line Genesis Eco-Energy Developments would consider undertaking the construction of the authorised power line within the authorised corridor (DEA Ref.: 12/12/20/1929) to connect the PV Facility via a turn-in turn-out connection to the completed power line which will connect to the existing Mookodi 400/132KV Substation located to the west of the site.

connection will start on the northern boundary of the on-site substation and will extend to the north and thereafter to the west in order to connect to the Woodhouse 88/22kV Substation. The route will primarily follow the existing Delareyville Munic / Vryburg 1 88kV Feeder located in the north of the project area. The length of power line to be constructed for the utilisation of this alternative is approximately 747m and is the longest power line route alternative considered for the Woodhouse Solar 2 PV Facility.

- Alternative 3: will be the construction of a 132kV power line between the on-site facility substation and the existing Delareyville Munic / Vryburg 1 88kV Feeder located along the northern boundary of the project site. The 132kV power line will start on the northern boundary of the facility on-site substation and extent towards the existing power line to establish the connection. The length of the power line required to establish the connection is approximately 146m.
- Alternative 4: includes the construction of a 132kV power line between the on-site substation and the authorised 132kV Eskom Bophirima–Mookodi power line (to be constructed). The route will start on the northern boundary of the on-site substation and extent north to connect into the power line via a turn-in turn-out connection. The length of power line to be constructed for the utilisation of this alternative is approximately 80m and is the shortest power line route alternative considered for the Woodhouse Solar 2 PV Facility.

Two solar energy technology alternatives are being considered for the proposed project and include (panel height will not exceed 5m):

- Fixed mounted PV systems (static/fixed-tilt panels);
- Tracking PV systems (with solar panels that rotate around a defined axis to follow the sun's movement).

Locality and size:

The Woodhouse Solar 2 PV Facility is proposed to be developed on the Remaining Extent of Farm Woodhouse 729, located approximately 10 km south east of Vryburg in the North West Province. The PV facility is proposed to include several arrays of photovoltaic solar panels with a contracted capacity of up to 100MW. A broader study area of approximately 2 264ha is being considered for the PV facility. The development footprint for the PV facility is anticipated to be approximately ~244ha in extent, depending on the specific technology to be implemented. Therefore, the facility and the associated infrastructure can be appropriately placed within the boundaries of the broader study area (i.e. the Remaining Extent of the farm Woodhouse 729) to avoid environmental and social sensitivities. The proposed PV Facility falls within the jurisdiction of the Naledi

Local Municipality, which forms part of the Dr Ruth Segomotsi Mompati District Municipality (see Figure 1 the locality map).

Construction phase:

» *Duration:* It is estimated that the construction phase for the PV facility and associated infrastructure is to extend over a period of 12-18 months.
» *Capital expenditure:* The total construction capital expenditure associated with the PV facility is estimated to be in the region of R1.5 billion (2016 Rand value). In terms of business opportunities for local companies, expenditure during the construction phases will create business opportunities for the regional and local economy.
» *Employment opportunities and wages:* The PV facility is likely to create approximately ~300-400 employment opportunities, depending on the final design. Of this approximately 60% of the opportunities will be available to low-skilled workers (construction labourers, security staff etc.), 25% will be available to semi-skilled workers (drivers, equipment operators etc.), and 15% will be available to skilled personnel (engineers, land surveyors, project managers etc.). Majority of low-skilled and semi-skilled opportunities are likely to be available to local workers (± 200). The total wage bill for the construction of the 100MW solar energy facility is estimated to be in the region of R50 million (2016 Rand value). The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area.
» *Skills development and training:* The developer has indicated that there will be opportunities for on-site skills development and training for employees during the construction phase.
» *Labour accommodation:* The developer has indicated that no on-site accommodation is envisaged. Most labourers will be sourced from the local area and will not be housed on site, given the relative proximity of the PV Facility to Vryburg. However, overnight site worker presence will be limited to security staff; a security team is likely to be present at the construction camp at all times. Labourers and skilled staff from outside the area will be housed off-site within the town of Vryburg.
» *Transportation of components and equipment:* Transportation of project components and equipment to the location of the proposed PV facility would be transported using vehicular / trucking transport. The national, secondary and internal access roads will be used to transport all components and equipment required during the construction phase of the facility. Some of the components (i.e. substation transformer) may be defined as abnormal loads in terms of the Road Traffic Act (Act No. 29 of 1989) [2] by virtue of the dimensional limitations. Typical civil engineering construction equipment will

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

need to be brought to the location of the PV facility development area (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the PV support structures, construction of the substation and site preparation. Access to the PV Facility will be off the regional road (R34) on the secondary unsurfaced road, known as the Amalia road, located along the western boundary of the affected property. Both the R34 and the secondary roads to the study area will be the main roads used for transportation of project components and equipment.

Operation phase:

» *Duration:* PV panels are designed to be operational for at least 20-25 years.
» *Employment*: Full-time operational and maintenance crews would be required for the solar energy facility. Based on information provided by the developer, the PV facility will create approximately ~60 full-time equivalent employment positions during the operation phase. The number of low-skilled personnel will comprise 70% of the workforce, semi-skilled will comprise 25% and skilled will comprise 5% of the workforce during the operation phase. The annual wage bill for the operation phase is estimated to be approximately R60 million (2016 Rand value). The injection of income into the area in the form of wages will represent an opportunity for the local economy.
» *Skills development and training:* There will be opportunities for on-site skills development and training within the operation phase.
» *On-site presence*: PV panels are designed to operate continuously, unattended and with low maintenance. Regular monitoring and maintenance activities every few weeks would be required to ensure safe and consistent operation for at least 20-25 years (i.e. A mobile team for maintenance such as, cleaning of solar panels and road and vegetation maintenance).

Decommissioning phase:

The PV infrastructure is anticipated to have a lifespan of approximately 25 years. It is a possibility that the PV panels will be replaced with more modern technology at the end of their lifespan, but this will depend on the need for the facility at the time. Disassembling and replacement activities will require the transport of abnormal loads to and within the PV facility. Decommissioned components will be removed from the PV facility and reused, recycled or disposed of in accordance with regulatory requirements. According to current legislation, infrastructure will have to be removed and the site rehabilitated once final decommissioning has occurred. Decommissioning activities will be required to be undertaken in accordance with the relevant legislation at the time.

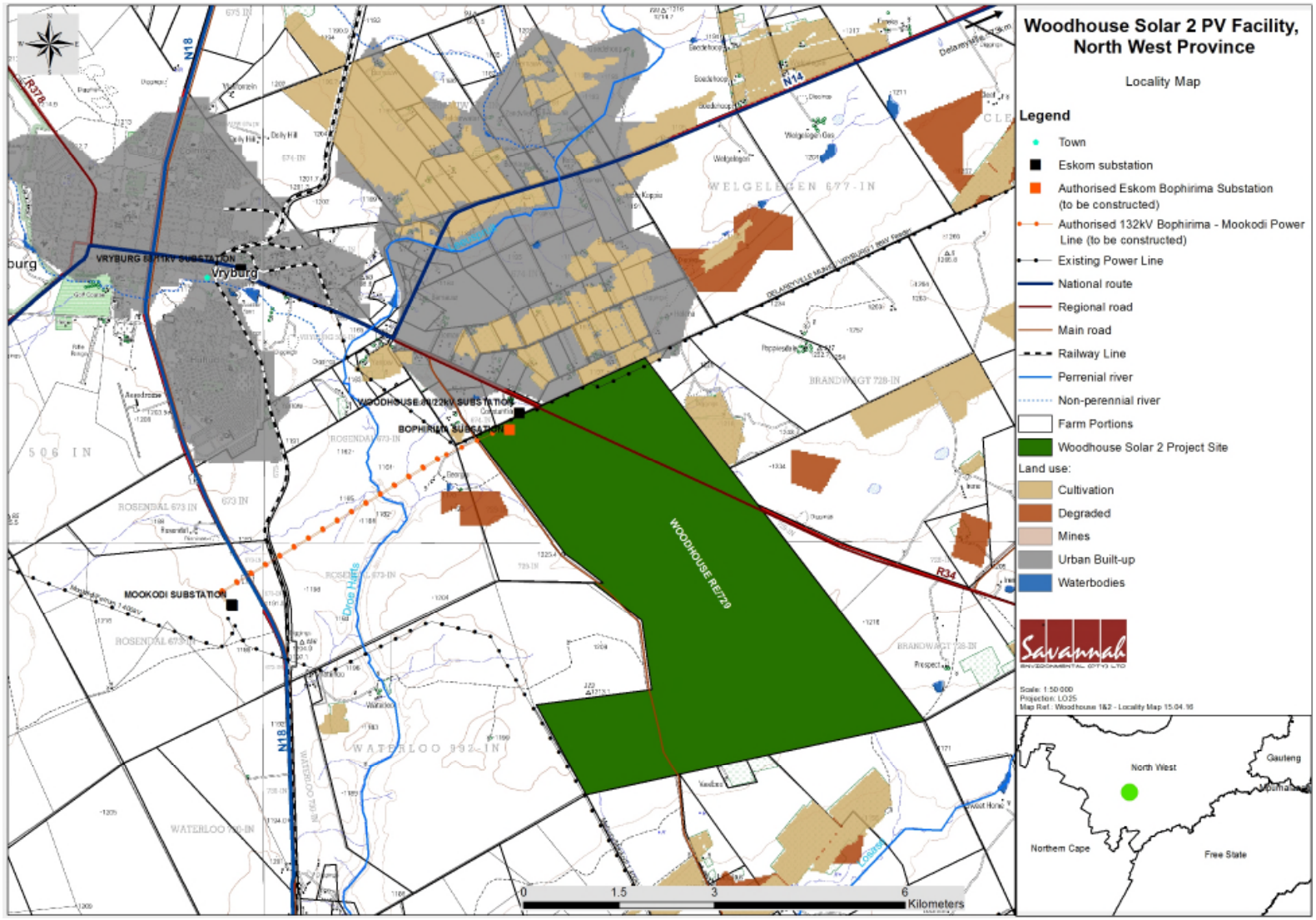

Figure 1: Location of the proposed Woodhouse Solar 2 PV facility near Vryburg in the North West Province

2. METHODOLOGY AND APPROACH

2.1. Approach to Study

The main aim for the social report is to determine the social impacts that may arise from the proposed PV facility. The approach used for the SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on the international best practice. The key objectives in the SIA process include:

- Describing and obtaining an understanding of the proposed PV facility (type, scale, location), the communities likely to be affected and determining the need and scope of the SIA;
- Collecting baseline data on the current social environment and historical social trends;
- Identifying and collecting data on the Social Impact Assessment variables and social change processes related to the proposed intervention. This requires consultation with affected individuals and communities;
- Assessing and documenting the significance of social impacts associated with the proposed project;
- Assessing the project (including any feasible alternatives) and identifying potential mitigation and enhancement measures;
- Developing an Environmental Management Plan.

2.2. Data Collection

Primary and secondary data sources were utilised to inform the study in aid of the objectives of the study. Primary data sources for the SIA included the following:

- A site visit undertaken on Thursday 16 March 2016. Observations were made while on site and within the study area.
- Meetings were arranged and held with key representative stakeholders to collect primary social data (see Table 4). Meetings were held with individuals that were both directly and indirectly associated with the proposed PV facility. Data collection was primarily gathered from meetings held with the impacted landowner, adjacent landowners, and the local and district municipality.
- Consultations with key stakeholders took place on 16 - 17 March 2016. Numerous key stakeholders were visited personally; where face-to-face meetings were not possible, telephonic discussions took place with as many stakeholders as could be reached. Key stakeholders in the area were contacted to advise them of the project and/or to arrange meetings. Stakeholders that were unable to meet were briefed over the phone on the

background of the project, an overview of the environmental assessment process was provided and social issues / concerns / questions associated with the proposed PV facility were discussed.

» Key stakeholders were contacted and meeting arrangements were made with key stakeholders during the social consultation process (see Appendix B).
» Email correspondence took place with the key stakeholders. The background information document and the comments and response form was emailed to the stakeholders to provide more detailed information about the project, advise them of the opportunity to comment and to arrange meetings.
» A project specific questionnaire was developed and utilised for the semi-structured meetings (see minutes of meetings in Appendix B). These meetings formed the basis of the primary data collection and assisted with the gathering of baseline information as well as establishing the stakeholder's perceptions, interests and concerns on the proposed PV facility.
» Meetings were held with the following key stakeholders catalogued in Table 4 below.

Table 4: Stakeholder consultations

WOODHOUSE SOLAR MEETINGS		
Meeting	**Details**	**Notes**
Wednesday 16 March 2016		
Impacted & Adjacent Landowner Name: Hugh Webber	Date: Wednesday 16 March 2016 Time: 12:30-13:00	*Farm Owner:* Woodhouse RE/729, Lockerbie RE/727, Lockerbie RE/7/727 *Meeting Address:* Lives on farm, 1km from substation.
Adjacent landowner Name: Bertus Meyer	Date: Wednesday 16 March 2016 Time: 13:30-14:00	*Farm Owner:* Champions Kloof Re/4/731
Adjacent Landowner Name: Danie Jacobs	Date: Wednesday 16 March 2016 Time: 14:30-15:00	*Farm Owner:* Brandwagt RE/1/728 *Meeting Address:* Farm Geluk, Schweizer Reneke
Adjacent landowner Name: JD & Carla Van Der Vyver	Date: Wednesday 16 March 2016 Time: 16:00-16:30	*Farm Owner:* Brandwagt RE/2/728, Brandwagt 14/728 & Lockerbie RE/1/727
Thursday 17 March 2016		
Adjacent landowner Name: Hermanus van Zyl	Date: Thursday 17 March 2016 Time: 08:30-09:00	*Farm Owner:* Bernauw 56/674

WOODHOUSE SOLAR MEETINGS		
Meeting	**Details**	**Notes**
Naledi Local Municipality IDP manager, Electricity Manager & Ward 5 Councillor Name: Bernard Kgodumo (ward 5 Councilor) Name: Gilbert (manager electricity)	Date: Thursday 17 March 2016 Time: 09:30-10:00	*Address:* 19 Market Street, Vryburg
Adjacent landowner Name: Mr Badenhorst	Date: Thursday 17 March 2016 Time: 10:30-11:00	*Farm Owner: Farm* Bernauw 32/674
Adjacent landowner Name: Chris Van Zyl (Doctor)	Date: Thursday 17 March 2016 Time: 11:30-12:00	*Farm Owner:* Waterloo 992 *Meeting Address:* 28 Voortrekker Street, Vryburg

Secondary data, mostly collected by means of a desktop study, was gathered and analysed for the purpose of the study. The following documents were examined:

- Project maps;
- A desktop aerial study of the affected area through the use of the latest version of Google Earth Pro 2016;
- The scoping report – to ensure that all the issues have been addressed at the EIA stage of the process;
- The background information document (BID);
- The Woodhouse Solar 2 stakeholder database;
- The 2011 South African Census Survey and the Local Government Handbook;
- Planning documentation such as District Municipality (DM) Integrated Development Plans (IDPs), Spatial Development Framework (SDF) and Environmental Management Framework (EMF) as well as the Local Municipality (LM) IDPs and policies;
- Relevant guidelines, policies and plan frameworks, as outlined in Section 3 of this report;
- Other similar specialist studies and relevant information where there have been cross-cutting issues, such as the EIAs undertaken for previous solar energy facilities in the North West Province and other parts of South Africa; and
- Literature reviews of social issues associated with solar energy facilities.

Information that was relevant to the project was identified and assessed from these sources within the context of the pre-construction, construction, operation and decommissioning phases of the proposed project. The evaluation of the

social impacts involved the assessment of both quantitative and qualitative data and the use of professional judgement. Quantitative data collected through national sources or local level interviews is assessed and analysed with sociological techniques (see Figure 2). However, qualitative data collected using the same methodology is more open to interpretation. In addition, what is a major impact to one person, one household or one community may be a minor impact to another according to specific personal circumstances. Hence, the results do not lend themselves easily to being ranked or assessed in exactly the same way as environmental data.

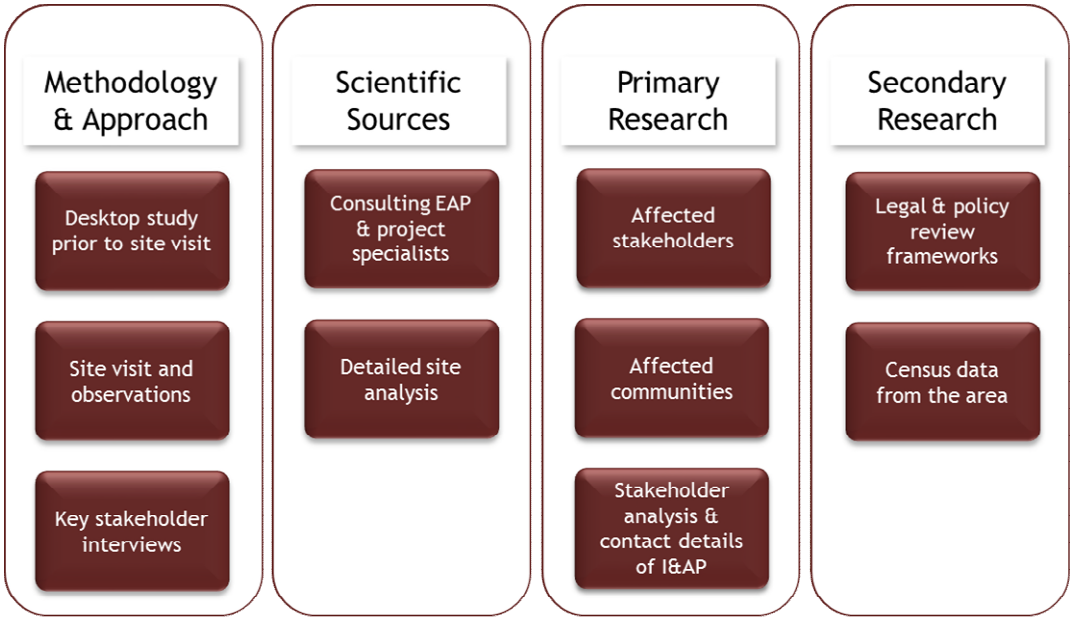

Figure 2: Research methodology and sources diagram

2.3. Public Participation Process

The Public Participation Process (PPP) played an important part in the EIA process. The process of stakeholder disclosure consultation is an ongoing overarching requirement that applies to the entire SIA process, and where possible, the PPP and SIA processes have been integrated. Effective consultation with stakeholders is important to understand the concerns and requirements of affected communities and ensuring their participation in the formulation and refinement of the project design. Relevant stakeholders are informed about the proposed project and thereafter are able to register and participate in the environmental impact assessment process. The communications during the PPP and written submission of comments have been reviewed and issues raised through this process have been incorporated into the SIA where relevant. The PPP involves raising awareness of the proposed PV facility by providing information about the proposed project to all interested and affected parties and providing an opportunity for these parties to raise any issues and/or concerns

regarding the project. Consultations were of critical importance in gaining insights into the key environment and social issues and concerns of communities and other stakeholders, and in aiding the development of potential strategies for addressing these impacts.

2.4. Impact Evaluation Method

This section provides an overview of the method used to identify and evaluate the social impacts for the construction and operation phase of the solar energy facility. The main objective is to determine the social risks and opportunities, and positive and adverse impacts of the solar energy facility. The methodology below allows for the evaluation of the overall effect of a proposed activity on the social environment. This includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of social impacts is to be assessed by means of the criteria of extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive).

The **nature** of the impact refers to the causes of the effect, what will be affected and how it will be affected.

Extent (E) of impact
Local (site or surroundings) to Regional (provincial)
Rating = 1 (low) to 5 (high).

Duration (D) rating is awarded as follows:
Whether the life-time of the impact will be:

- Very short term – up to 1 year: Rating = 1
- Short term – >1 – 5 years: Rating = 2
- Moderate term - >5 – 15 years: Rating = 3
- Long term – >15 years: Rating = 4
  - The impact will occur during the operational life of the activity, and recovery may occur with mitigation (restoration and rehabilitation).
- Permanent – Rating = 5
  - The impact will destroy the ecosystem functioning and mitigation (restoration and rehabilitation) will not contribute in such a way or in such a time span that the impact can be considered transient.

Magnitude (M) (severity):
A rating is awarded to each impact as follows:

- Small impact – the ecosystem pattern, process and functioning are not affected.
  Rating = 0
- Minor impact - a minor impact on the environment and processes will occur.
  Rating = 2

» Low impact - slight impact on ecosystem pattern, process and functioning.
Rating = 4
» Moderate intensity – valued, important, sensitive or vulnerable systems or communities are negatively affected, but ecosystem pattern, process and functions can continue albeit in a slightly modified way.
Rating = 6
» High intensity – environment affected to the extent that the ecosystem pattern, process and functions are altered and may even temporarily cease. Valued, important, sensitive or vulnerable systems or communities are substantially affected.
Rating = 8
» Very high intensity – environment affected to the extent that the ecosystem pattern, process and functions are completely destroyed and may permanently cease.
Rating = 10

Probability (P) (certainty) describes the probability or likelihood of the impact actually occurring, and is rated as follows:
» Very improbable – where the impact will not occur, because of either design or historic experience.
Rating = 1
» Improbable – where the impact is unlikely to occur (some possibility), either because of design or historic experience.
Rating = 2
» Probable - there is a distinct probability that the impact will occur (<50% chance of occurring).
Rating = 3
» Highly probable - most likely that the impact will occur (50 – 90% chance of occurring).
Rating = 4
» Definite – the impact will occur regardless of any prevention or mitigating measures (>90% chance of occurring).
Rating = 5

Significance (S) - Rating of low, medium or high. Significance is determined through a synthesis of the characteristics described above where:
S = (E+D+M)*P

The **significance weighting** should influence the development project as follows:
» Low significance (significance weighting: <30 points)
If the negative impacts have little real effects, it should not have an influence on the decision to proceed with the project. In such circumstances, there is a significant capacity of the environmental resources in the area to respond to

change and withstand stress and they will be able to return to their pre-impacted state within the short-term.

» Medium significance (significance weighting: 30 – 60 points)
If the impact is negative, it implies that the impact is real and sufficiently important to require mitigation and management measures before the proposed project can be approved. In such circumstances, there is a reduction in the capacity of the environmental resources in the area to withstand stress and to return to their pre-impacted state within the medium to long-term.

» High significance (significance weighting: >60 points)
The environmental resources will be destroyed in the area leading to the collapse of the ecosystem pattern, process and functioning. The impact strongly influences the decision whether or not to proceed with the project. If mitigation cannot be effectively implemented, the proposed activity should be terminated.

2.5. Limitations and Assumptions

The following assumptions and limitations were relevant:

» The 2011 Census is the most recent source of official statistics and this has been used for generating a lot of the information provided in the baseline profile of the study area. In addition to this, the latest District and Local Municipality policies and plans were utilised in generating information. While the data does provide useful information, it should be noted that this data may now be out of date to some degree and may no longer accurately reflect the current socio-economic profile.

» This study was done with the information available to the specialist at the time of executing the study, within the available timeframes. The sources consulted are not exhaustive, and additional information which might strengthen arguments, contradict information in this report, and/or identify additional information might exist. The specialist did try to take an evidence-based approach in the compilation of this report and did not intentionally exclude scientific information relevant to the assessment.

» A limited amount of finalised project details from the project developer means that some of the actual project projections may be higher or lower than estimated in this report.

» It was assumed that the motivation for, planning and feasibility study of the project were undertaken by the developer with integrity, and that information provided to date by the project developer, the independent environmental assessment practitioner and the public participation consultant was accurate.

3. LEGISLATION AND GUIDELINES

A review of the policy environment provides valuable insight into the government's priorities and plans. The review of the relevant planning and policy documents was undertaken as a part of the SIA process. The key documents reviewed included:

National Policies:

- The Constitution of the Republic of South Africa (Act 108 of 1996)
- The National Environmental Management Act (107 of 1998) (NEMA)
- The National Energy Act (34 of 2008)
- Department of Energy Strategic Plan 2015-2020
- National Development Plan 2030
- National Climate Change Response Green Paper (DEA, 2010)
- White Paper on Energy Policy of the Republic of South Africa (1998)
- White Paper on Renewable Energy of the Republic of South Africa (2003)
- National Integrated Resource Plan South Africa (2010-2030)
- Strategic Infrastructure Projects (SIPs)

Provincial Policies:

- North West Province Spatial Development Framework (SDF) - North West Environmental Management Series 7 (2008)
- North West Provincial Growth and Development Strategy (PGDS) (2004-2014)

Local and District Policies:

- Dr Ruth Segomotsi Mompati District Municipality (DRSMDM) Integrated Development Plan (IDP) (2015/2016)
- Naledi Local Municipality (NLM) Integrated Development Plan (2015/2016)

Solar Energy Policies:

- Solar Energy Technology Roadmap (2013)
- Renewable Energy Development Zones (REDZs)

The legislative and policy context plays an important role in identifying and assessing the potential social impacts associated with the proposed PV facility. In this regard a key component of the SIA process is to assess the proposed PV facility in terms of its suitability with regards to the key planning and policy documents. A brief overview of the most relevant policies, plans and guidelines, in relation to the proposed solar facility are discussed in this section below.

3.1. National Policies

Any project contributing to the objectives mentioned within the national policies, discussed briefly below, could be considered strategically important for the nation. The review of the policy environment suggests that utilisation of renewable energy sources in the country is considered to be an integral means of reducing

the carbon footprint of South Africa, diversifying the national economy, and reducing poverty. As the project would contribute a renewable energy supply to provincial and national targets set out and supported within these national policies, it is considered that the proposed PV facility fits within the national policy framework. A brief review of the most relevant national policies is provided below.

3.1.1. The Constitution of the Republic of South Africa (Act 108 of 1996)

The Constitution of the Republic of South Africa (Act 108 of 1996) has been adopted as the supreme law of the country and forms the foundations for a democratic society in which fundamental human rights are protected. In terms of the environment, Chapter 2 Section 24 states that everyone has a right:

(a) "To an environment that is not harmful to their health or well-being; and
(b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

i. *prevent pollution and ecological degradation;*
ii. *promote conservation; and*
iii. *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

Chapter 7 defines the role of local government in its community. Five objectives of local government are described in Chapter 7 Section 152:

- to provide democratic and accountable government for local communities;
- to ensure the provision of services to communities in a sustainable manner;
- to promote social and economic development;
- to promote a safe and healthy environment; and
- to encourage the involvement of communities and community organisations in the matter of local government.

The Constitution outlines the need to promote social and economic development. An SIA is a requirement for sustainable development as it assesses the social impacts associated with development and aims towards safeguarding people's future well-being. The proposed solar energy facility aims to increase the economic opportunities of the area by providing more job opportunities for the local community. The development will also aid in promoting a healthy environment through the provision of clean, renewable energy.

3.1.2. The National Environmental Management Act (107 of 1998) (NEMA)

NEMA is the legislation setting out the framework for environmental management in South Africa. The Act promotes cooperative environmental governance and establishes principles for decision making on matters affecting the environment.

An overarching principle in Chapter 1 emphasises that development must be socially, environmentally and economically sustainable.

The EIA Regulations (Government Notices R982-985 of December 2014) define an environmental impact assessment as 'the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application'. The SIA aims to fulfil these requirements by providing all social information relevant to the consideration of the project.

3.1.3. The National Energy Act (34 of 2008)

One of the objectives of the National Energy Act is to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including solar:

> *"To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements; to provide for increased generation and consumption of renewable energies (Preamble)."*

The National Energy Act aims to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors, as well as matters relating to renewable energy. The Act provides the legal framework which supports the development of renewable energy facilities for the greater environmental and social good.

3.1.4. Department of Energy Strategic Plan 2015-2020

The Department of Energy (DoE) is mandated to ensure secure and sustainable provision of energy for socio-economic development. This is achieved by developing an Integrated Resource Plan (IRP) for the entire energy sector and promoting investment in accordance with the IRP which focuses on energy. The DoE envisions the pursuance of the aforementioned mandate through the following strategic statements:

» *Aim*: Formulate energy policies, regulatory frameworks and legislation, and oversee their implementation to ensure energy security, promotion of environmentally-friendly energy carriers and access to affordable and reliable energy for all South Africans.

» *Vision*: Improving our energy mix by having 30% clean energy by 2025. The vision of the DoE will be realised by the following factors as depicted in Figure 3 below.
» *Mission*: To regulate and transform the energy sector for the provision of secure, sustainable and affordable energy.

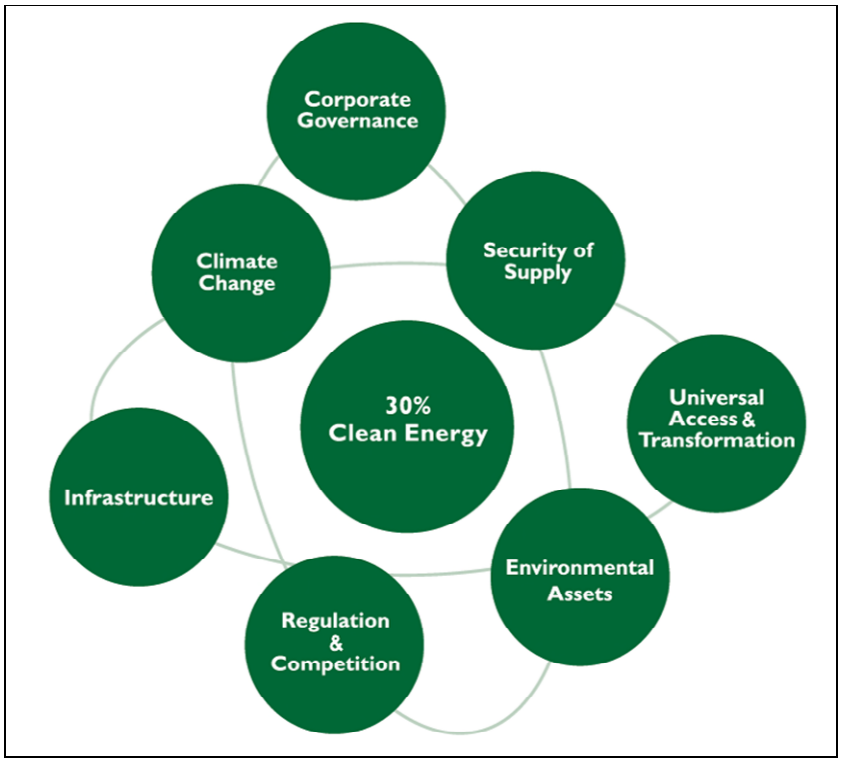

Figure 3: Factors affecting the DoE's 2025 vision of 30% clean energy by 2025

The DoE Strategic Plan 2015-2020 Programme 6 on Clean Energy focusses on managing and facilitating the development and implementation of clean and renewable energy initiatives as well as Energy Efficiency Demand-Side Management (EEDSM). Sub-programmes within Programme 6 include: energy efficiency, renewable energy, climate change and designated national authority. The proposed solar energy facility will contribute towards the DoE target of implementing 30% clean energy by 2025.

3.1.5. National Development Plan 2030

The National Development Plan aims to eliminate poverty and reduce inequality by 2030. Given the complexity of national development, the plan sets out a number of interlinked priorities, some of which include:

» Bringing about faster economic growth, higher investment and greater labour absorption.
» Focusing on key capabilities of people and the state.
» Building a capable and developmental state.

Enabling milestones include:

- » Increased employment from 13 million in 2010 to 24 million in 2030.
- » Establish a competitive base of infrastructure, human resources and regulatory frameworks.
- » Ensure that skilled, technical, professional and managerial posts better reflect the country's racial gender and disability makeup.
- » Increase the quality of education.
- » Provide affordable access to quality health care.
- » Establish effective, safe and affordable public transport.
- » Produce sufficient energy to support the industry at competitive prices, ensuring access for poor households, while reducing carbon emissions per unit of power by about one-third.
- » Ensure that all South Africans have access to clean running water in their homes.
- » Make high-speed broadband internet universally available at competitive prices.
- » Realise a food trade surplus, with one-third produced by small-scale farmers or households.

The National Development Plan aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The proposed solar energy facility will assist in reducing carbon emissions targets and creating jobs in the local area, as well as assist in creating a competitive infrastructure based on terms of energy contribution to the national grid.

3.1.6. National Climate Change Response White Paper (2011)

South Africa's response to climate change has two objectives: 1) to effectively manage the inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity; and 2) to make a fair contribution to the global efforts to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enabled economic, social and environmental development to proceed in a sustainable manner. The paper proposes a number of approaches dealing with climate change impacts with respect to selected sectors. Energy, in this context, is considered to be one of the key sectors that provides for possible mitigations to address climate changes. The White Paper provides support for the proposed PV facility which will contribute to managing climate change impacts, supporting the emergency response capacity, as well as assist in reducing GHG emissions in a sustainable manner.

3.1.7. White Paper on the Energy Policy of the Republic of South Africa (1998)

The White Paper on Energy Policy states the need to improve the energy security in the country by means of expanding the energy supply options. This implies the increase in the use of renewable energy and encouraging new entries into the generation market. The support for the renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly solar and wind and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account. Government policy on renewable energy is thus concerned with meeting the following challenges:

- Ensuring that economically feasible technologies and applications are implemented;
- Ensuring that an equitable level of national resources are invested in renewable technologies, given their potential and compared to investments in other energy supply options; and,
- Addressing constraints on the development of the renewable industry.

The policy states that the advantages of renewable energy include minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include: higher capital costs in some cases; lower energy densities; and lower levels of availability, depending on specific conditions, especially with sun and wind based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future. Therefore the policy supports the advancement of renewable energy sources at ensuring energy security through the diversification of supply, which is in line with the proposed solar energy facility.

3.1.8. White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)

The White Paper on Renewable Energy Policy supplements the Government's overarching policy on energy as set out in its White Paper on the Energy Policy of the republic of South Africa (DME, 1998). The White Paper on Renewable Energy Policy recognises the significance of the medium and long-term potential of renewable energy. The main aim of the policy is to create the conditions for the development and commercial implementation of renewable technologies. The position of the White Paper on Renewable Energy is based on the integrated resource planning criterion of:

> *"Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options."*

The White Paper on Renewable Energy sets out the Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa. South Africa relies heavily on coal to meet its energy needs because it is well-endowed with coal resources in particular. However South Africa is endowed with renewable energy resources that can be sustainable alternatives to fossil fuels, but which have so far remained largely untapped. This White Paper fosters the uptake of renewable energy in the economy and has a number of objectives that include: ensuring that equitable resources are invested in renewable technologies; directing public resources for implementation of renewable energy technologies; introducing suitable fiscal incentives for renewable energy and; creating an investment climate for the development of renewable energy sector. The White Paper on Renewable Energy of 2003 set a target of 10 000GWh to be generated from renewable energy by 2013. The target was reviewed during the renewable energy summit of 2009 held in Pretoria. The summit raised the issue over the slow implementation of renewable energy projects and the risks to the South African economy of committing national investments in the energy infrastructure to coal technologies. Other matters that were raised include potential large scale roll out of solar water heaters and enlistment of Independent Power Producers to contribute to the diversification of the energy mix. The objectives of the White Paper on Renewable Energy are considered in six focal areas, namely: financial instruments, legal instruments, technology development, awareness raising, capacity building and education, and market based instruments and regulatory instruments. The policy supports the investment in renewable energy facilities as they contribute towards ensuring energy security through the diversification of energy supply, reducing GHG emissions and the promotion of renewable energy sources.

3.1.9. National Integrated Resource Plan for South Africa (2010-2030)

The primary objective of the Integrated Resource Plan (IRP) is to determine the long term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. However, the IRP also serves as input to other planning functions, *inter alia* economic development, and funding, and environmental and social policy formulation. The accuracy of the IRP is to be improved by regular reviews and updates. The National Integrated Resource Plan 2010 projected that an additional capacity of up to 56 539MW of generation capacity will be required to support the country's economic development and ensure adequate reserves over the next twenty years. The required expansion is more than two times the size of the existing capacity of the system. A significant component of the plan, amongst others, is the expansion of the use of renewable energy sources to reduce carbon emissions involved in generating electricity. In this regard, the IRP supports the development of 17GW of renewable energy

generation by 2030. The proposed solar energy facility contributes to the targets in this policy.

3.1.10. Strategic Infrastructure Projects (SIPs)

The Presidential Infrastructure Coordinating Committee (PICC) are integrating and phasing investment plans across 18 Strategic Infrastructure Projects (SIPs) which have five core functions: to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services, and support the integration of African economies. A balanced approach is being fostered through greening of the economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development, and enabling regional integration.

SIP 8 of the energy SIPs supports the development of the solar energy facility which is as follows:

» *SIP 8: Green energy in support of the South African economy:*
Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010) and supports bio-fuel production facilities.

3.2. Provincial Policies

A brief review of the most relevant provincial policies is provided below. The proposed facility is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

3.2.1. North West Provincial Growth and Development Strategy (PGDS) (2004- 2014)

The North West Provincial Growth and Development Strategy (PGDS) provides a framework for integrated and sustainable growth and economic development for the Province and its people. Challenges facing the Province are as follows: the Province is mostly rural in nature; it has a low population density and relative inadequate infrastructure, especially in the remote rural areas; the Province has inherited an enormous backlog in basic service delivery and maintenance that will take time to eradicate; the population is predominantly poor with high levels of illiteracy and dependency that seriously affect their productivity and ability to compete for jobs; the Province is characterised by great inequalities between the rich and poor as well as disparities between urban and rural; the Province is faced with HIV/AIDS as a social and economic challenge; available resources are unevenly distributed and there is limited potential for improved delivery of

services and growth. From the above, job creation and poverty eradication together with the low level of expertise and skills; stand out as the greatest challenges to be resolved within the Province.

Goals and objectives of the PGDS are to fight poverty and unemployment, improve the low level of expertise and skills which are classified as both immediate and long term goals and require primary goals for sustained growth and economic development. The proposed facility will contribute to employment creation and skills development which is in line with the goals and objectives of the North West PGDS.

The North West PGDS aims at building a sustainable economy to eradicate poverty and improve social development. The proposed facility will contribute to growth and development of the local area by expanding the economic base and creating employment opportunities.

3.2.2. North West Province Spatial Development Framework (SDF) - North West Environmental Management Series 7 (2008)

The North West Provincial Government (NWPG) has recently adopted a ten-year growth and development strategy for the Province known as North West 2014. In order to fight poverty, unemployment and low levels of skills and expertise, this strategy has two goals. The *Economic Goal* which requires an average economic growth rate of 6.6% per annum and the *Poverty Eradication Goal* to wipe out the basic needs backlog which annually will require investment estimated at R854 million. The key pillars for growth and economic development are:

» Agriculture and rural development
» Mining and energy
» Manufacturing
» Trade and finance
» Tourism
» Construction and infrastructure
» Small Medium and Micro Enterprise
» Training and Skills Development

The strategy lists a number of transversal objectives of which one is "Ensuring sustainable development through resource and environmental management". The Provincial Spatial Development Framework and Environmental Management Plan (PSDF–EMP) is one of the fundamental implementation instruments of North West 2014 and provides the spatial dimension for this strategy. The key emphasis is on economic growth and poverty eradication. This version mainly provides statements of objectives, key development issues, development concepts/ principles, and the spatial development rationale. The Spatial Development Framework (SDF) addresses the need for spatial planning, socio-

economic development, infrastructure and conservation of natural resources. Key socio-economic issues which would require strategic planning provision include: employment (including youth and women); poverty eradication; attracting Investment; economic growth; HIV / AIDS and other diseases; food security; physical infrastructure (including availability of industrial land); illiteracy; tourism development; population growth, urbanisation and migration. Natural resource issues include inadequate water resources for future development; bush encroachment and alien invasive species; land and soil degradation; and overgrazing. With regard to spatial planning, the legacies of Apartheid-era policy is identified as a key issue and residents of the North West are consequently extremely underdeveloped.

The proposed PV facility will contribute to economic growth and development, which will in turn help eradicate poverty through job creations and skills development in the region which will be in line with the North West SDF.

3.3. District and Local Municipalities Policies

These strategic policies at the district and local levels have similar objectives for the respective areas, namely to accelerate economic growth, create jobs, uplift communities and alleviate poverty. The proposed PV facility is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

3.3.1. Dr Ruth Segomotsi Mompati District Municipality (DRSMDM) Integrated Development Plan (IDP) (2015/2016)

The mission of the district is, "to ensure optimal utilisation of available resources through effective, efficient, sustainable integrated planning and corporate governance."

The existing level of development and challenges in DRSMDM can be summarised as follows:

- » DRRSM is endowed with minerals but this sector remains a small contributor to GDP of the Province;
- » Population is largely African with low education, low incomes, high unemployment and with minimal access to water and sanitation;
- » The large African population is largely young with a small percentage of adults who are economically active;
- » Functional literacy does not favour Africans. There is a great challenge in the provision of education to empower Africans;
- » Heavy dependency on public administration as employer. There is a critical need to develop the private sector in agriculture and mining

involvement. The development of the Small Medium Micro Enterprise (SMME) sector both in the formal and informal sectors is critical.
» Current access to water and sanitation services is a concern.

The above calls for associated action to improve delivery of the needed services for socio and economic development in the DRSMDM.

The Key Performance Areas (KPA) of the district are as follows:
» *Service delivery and infrastructure development:* Objective is to eradicate backlogs in order to improve access to services and ensure proper operations and maintenance.
» *Public participation and good governance (governance structures):* Objective is to promote a culture of participatory and good governance.
» *Institutional development and transformation:* Objective is to improve organisational cohesion and effectiveness.
» *Financial viability:* Strategic objective is to improve overall financial management in the municipalities by developing and implementing appropriate financial management policies, procedures and systems.
» *Local economic development:* Strategic objective is to create an environment that promotes the development of the local economy and facilitate job creation.
» *Community services & development:* All citizens have a right to an environment that is not detrimental to human health, and it imposes a duty on the State to promulgate legislation and to implement policies aimed at ensuring that this right is upheld.

The strategic objective of the North West Department of Rural, Environmental and Agricultural Development (READ) is to facilitate and promote local economic development in the district through existing and shared partnerships. The district is an agricultural hub within the Province and as a result, special attention is given to promoting agricultural initiatives and ensuring value chain benefits from the sector. While it is acknowledged that agriculture is one of the main sectors contributing effectively to the Province's GDP, the district needs to ensure equitable focus on other sectors of the economy.

The following were identified as key strategic intervention areas to be prioritised from 2014 -2017:
» Promotion of Local Economic Development (Agriculture, Agri-Business, Land and Rural Development)
» Service Delivery (Infrastructure Development and Transportation)

Attraction of major investments to the district remains a challenge because of the poor infrastructure conditions, more specifically roads, water networks or reticulation, communication, electricity and transport networks. The critical

importance of commitment to transforming the economy of the district therefore remains emphasised. This will ensure that job opportunities are increased for the unemployed masses (mainly the youth) of the DRSMDM.

The IDP aims at promoting local economic growth and social development in order to provide a better life for the communities. The proposed facility will provide employment opportunities and contribute in assisting the district municipality in achieving local economic development and building a sustainable economy through introducing a relatively new sector into the local economy.

3.3.2. Naledi Local Municipality (NLM) Integrated Development Plan (IDP) (2015-2016)

One of the primary objectives of the IDP process was to create a new vision for the Naledi Local Municipality's future local economic development based on its unique strengths and its capacity to leverage existing assets to generate revenue.

Based on the needs analysed in the IDP processes and the Naledi Spatial Development Framework (SDF, 2013), the following key strategic interventions are proposed by the NLM:

- *Strategic Intervention A:* Regional development hub
  - The location of Vryburg at the intersection of N18, R34, R34 and R378 highlights the strategic locality of this town within the municipal and district context.
  - From a strategic development point of view, Vryburg should be enhanced and supported to develop into a fully-fledged regional node of importance. This can be achieved by improving the services function of the town in terms of social, retail, industrial and institutional development.
- *Strategic Intervention B:* CBD Revitalisation
  - The Central Business District (CBD) of Vryburg serves as the economic and commercial heart of the municipal area, where most of the municipal business, retail, financial government and commercial services are situated. The SDF notes that the CBD's service function can be enhanced and investments attracted through a revitalisation strategy that addresses the improvement of overall environmental quality of the area, upgrading of taxi ranks, upgrading and landscaping of sidewalks, municipal parks and improved waste management.
- *Strategic Intervention C:* Development of the cattle industry
  - The wider impact of the cattle and beef industries and its potential for regional economic growth should also receive priority attention.
- *Strategic Intervention D:* Growth of the game farming, hunting and eco-tourism industries

- The local municipality is strongly supportive of the growth of game farming, game trading and responsible hunting. It also realises the immense potential for the expansion of ecotourism opportunities. The hunting and agricultural sectors are the single biggest contributors to employment in the local economy (27.8%) and NLM will support all feasible efforts to grow these industries and increase its contribution to local economic development. This will require high levels of cooperation between the industries, local government, relevant provincial and national authorities and local communities to ensure maximum benefits are derived from the growth of the sector.

» *Strategic Intervention E:* Maximise revenue opportunities:
- Within NLM it will address the issue of non-payment for services through active engagements with communities. This issue will be one of the primary themes during the IDP process.

» *Strategic Intervention F:* Uninterrupted basic service delivery:
- Naledi Local Municipality wants to improve performance with relation to delivery of basic engineering services and maintain current water, sanitation, electricity, refuse removal services and roads infrastructure better.

» *Strategic Intervention G:* Attract major renewable energy solar projects:
- While many renewable energy projects are large-scale, renewable technologies are suited to rural and remote areas and developing countries, where energy is often crucial in human development. United Nations' Secretary- General Ban Ki-moon has said that 'renewable energy has the ability to lift the poorest nations to new levels of prosperity.' The NLM wants to attract large scale renewable energy projects. The NLM aims to create an enabling environment for large scale solar renewable energy projects in its area.

The proposed facility falls in line with the Strategic Intervention G (attract major renewable energy projects into the area). The development will contribute to employment creation and economic growth, which in turn will have a positive multiplier effect on the local area. The IDP 2015/2016 supports the investment of renewable energy developments in the NLM.

3.4. Solar Energy Policies

3.4.1. Solar Energy Technology Roadmap 2013

Diffusion of renewable energy, generally, and solar technology, specifically, in South Africa is meant to address the government's desire to aggressively integrate renewable energy technologies into the national energy mix to reduce

the country's carbon emissions levels, to help address its growing electricity generation needs, and its industrial heat needs (DEA draft integrated Energy planning report, 2012). The use of solar radiation for power generation is considered a non-consumptive use of a natural resource which produces zero greenhouse gas emissions during its operation. The generation of renewable energy will contribute to South Africa's electricity market which has, to date, been heavily dominated by coal-based power generation. The advancement of renewable energy is a priority for South Africa as the government has set a goal of generating 17GW renewable electricity by 2030, as part of the IRP 2010. Furthermore, recent policy highlights the desirability of clean, green energy and solar generated energy will play a significant role in reaching these quotas.

3.4.2. Renewable Energy Development Zones (REDZs)

The Department of Environmental Affairs (DEA) has committed to contribute to the implementation of the National Development Plan and National Infrastructure Plan by undertaking Strategic Environmental Assessments (SEAs) to identify adaptive processes that streamline the regulatory environmental requirements for Strategic Integrated Projects (SIPs) while safeguarding the environment. The wind and solar photovoltaic (PV) SEA was accordingly commissioned by DEA in support of SIP 8, which aims to facilitate the implementation of sustainable green energy initiatives (CSIR, 2014).

This SEA identifies areas where large scale wind and solar PV energy facilities can be developed in terms of SIP 8 and in a manner that limits significant negative impacts on the environment, while yielding the highest possible socio-economic benefits to the country. These areas are referred to as Renewable Energy Development Zones (REDZs). The REDZs also provide priority areas for investment into the electricity grid. Suitable wind and solar PV development should still be promoted across the country and any proposed development must be evaluated on its own merit. The wind assessment domain for this first iteration of the SEA is based on the Wind Atlas for South Africa (WASA) coverage available at the time of commencing the SEA (i.e. parts of Northern Cape, Western Cape and Eastern Cape Provinces). The solar PV assessment domain was informed by the location of the majority of existing solar PV project applications at the commencement of the SEA and includes the five Provinces of Northern Cape, Western Cape, Eastern Cape, Free State, and North West. The assessment of these areas led to the identification of eight proposed REDZs with a combined size of approximately 80 000 km^2 and comprising about 17 000 farm portions (see Figure 4).

Figure 4: Renewable Energy Development Zones (REDZs) Focus Areas in South Africa (Source: CSIR)

Renewable Energy Development Zones (REDZs) are geographical areas;

» In which clusters (several projects) of wind and solar PV developments will have the lowest negative impact on the environment while yielding the highest possible social and economic benefit to the country;
» That are widely agreed to have strategic importance for wind and solar PV development;
» Where the environmental and other authorisation processes have been aligned and streamlined based on scoping level pre-assessments and clear development requirements; and
» Where proactive and socialised investment can be made to provide time efficient infrastructure access

In the Statement on Cabinet Meeting of 17 February 2016 the cabinet approved the gazetting of Renewable Energy Development Zones (REDZ). The aim of the zones are to streamline the regulatory process, identifying geographical areas where wind and solar Photovoltaic technologies can be incentivised and where intense grid expansion can be directed. These REDZ will ensure a transition to a low carbon economy, accelerating infrastructure development and contributing to a more coherent and predictable regulatory framework.

The proposed site for the Woodhouse Solar 2 PV Facility falls within the REDZ Zone 6 (Vryburg Focus Area) in the North West Province (see Figure 5), which is an area identified as having strategic importance for solar V development.

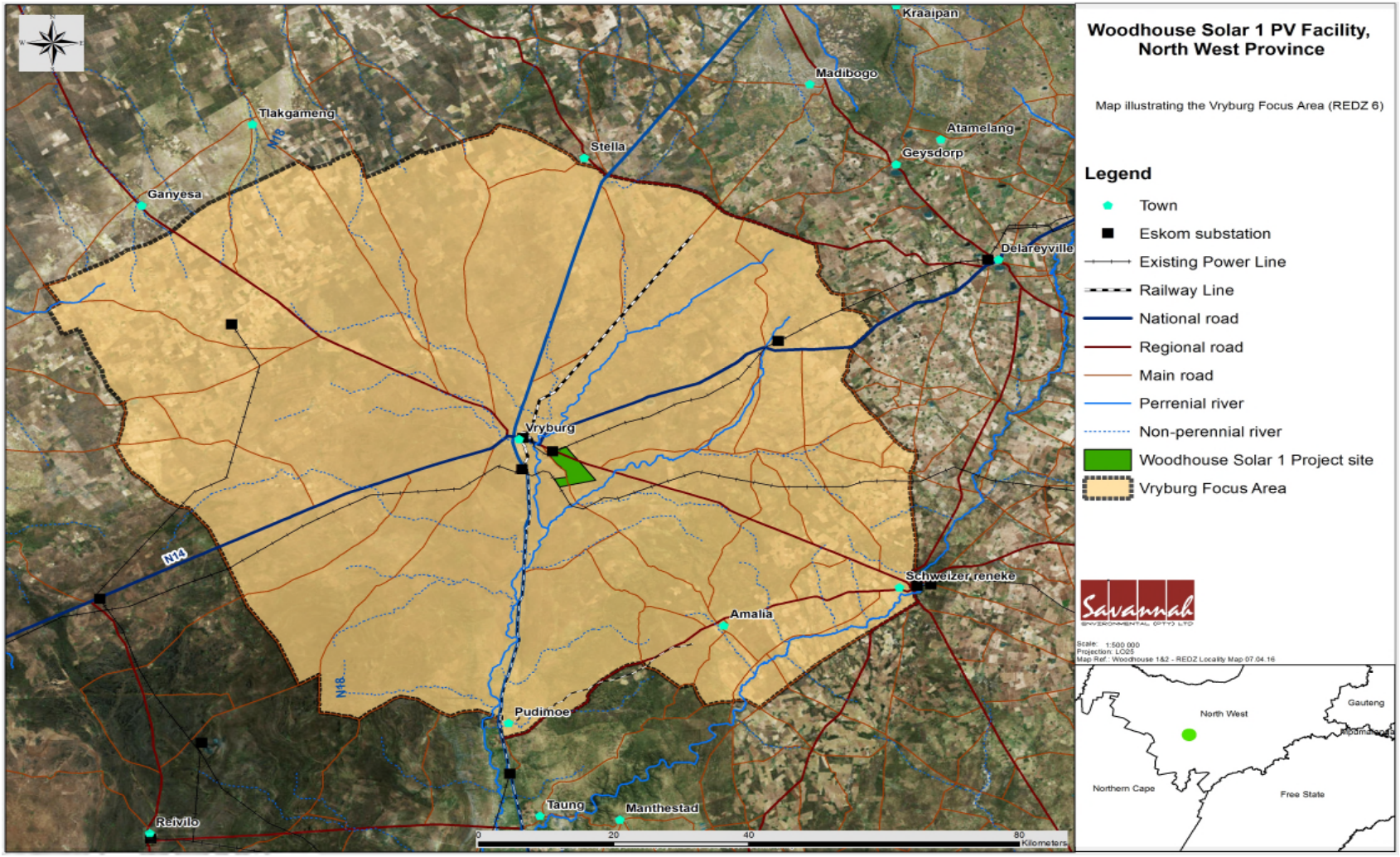

Figure 5: REDZ focus area in the North West Province and location of the proposed site in the REDZ (Source: CSIR)

3.5. Conclusion

The findings of the review of the relevant policies and documents pertaining to the energy sector indicate that solar energy and the establishment of solar energy facilities such as the one proposed is supported at a national, provincial, and local level, and that the proposed facility will contribute towards the various targets and policy aims.

4. SOCIO-ECONOMIC PROFILE

The proposed location for the Woodhouse Solar 2 PV Facility falls under the jurisdiction of the Naledi Local Municipality (NLM) and within the greater Dr Ruth Segomotsi Mompati District Municipality (DRSMDM) in the North West Province. The proposed PV facility site lies approximately 10km south east of Vryburg on the Remaining Extent of Farm Woodhouse 729. The purpose of the section is to provide an overview of the current socio-economic situation within the proposed broader study area. This section will provide a strategic understanding of the socio-economic profile of the North West Province, DRMSDM and NLM, in order to develop a better understanding of the socio-economic performance as a background to the development of the PV facility. The data presented in this section has been largely derived from the NLM IDP 2015/2016, DRMSDM IDP 2015/2016, the most recent (2011) Census, as well as the local government handbook 2012. Overall, this section will provide a brief overview of the study area; from a regional context, local context (which includes the baseline description of the local social environment), site context and surrounding land use context (which includes the land use character of the immediate area of influence).

4.1. Regional Context

4.1.1. North West Province

The North West Province is situated in the north of South Africa (see Figure 6). The Province shares the boundaries with Free State, Limpopo and Gauteng Provinces, and is the gateway to Botswana. It covers an area of ~104 882km² and has a population of ~3 509 953. Much of the Province consists of flat areas of scattered trees and grassland. The Vaal River flows along the southern border of the Province. Mahikeng (previously Mafikeng) is the capital of the Province. The biggest cities in the Province are Mmabatho, Potchefstroom and Klerksdorp. Other main towns within the Province include Brits, Rustenburg, and Lichtenburg. The North West Province is divided into four district municipalities which include; Bojanala District Municipality, Ngaka Modiri Molema District Municipality, Dr Ruth Segomotsi District Municipality and Dr Kenneth Kaunda District Municipality, which are further subdivided into 19 local municipalities (North West Province, Local Government Handbook, 2012).

Most of the economic activity is concentrated in the southern region of the North West Province between Potchefstroom and Klerksdorp, as well as Rustenburg and the eastern region. The North West Province is predominantly a rural Province with the main economic activities being mining and agriculture. Mining of diamond, marble and gold bring in substantial wealth. The Province is a world leader in platinum production. Mining is the major contributor to the North West

economy and represents almost a quarter of South Africa's mining industry as a whole. The Province produces a quarter of South Africa's gold, as well as granite, marble, fluorspar and diamonds (NAFCOC, 2014). The North West Province is well known for cattle farming, while the areas around Rustenburg and Brits are fertile where mixed-crop farming land occurs. Maize and sunflowers are the most important crops, and the Province is a major producer of white maize in the country (South Africa Info, 2014). The Province has a number of major tourist attractions, including the internationally famous Sun City, the Pilanesberg National Park, the Madikwe Game Reserve and the Rustenburg Nature Reserve.

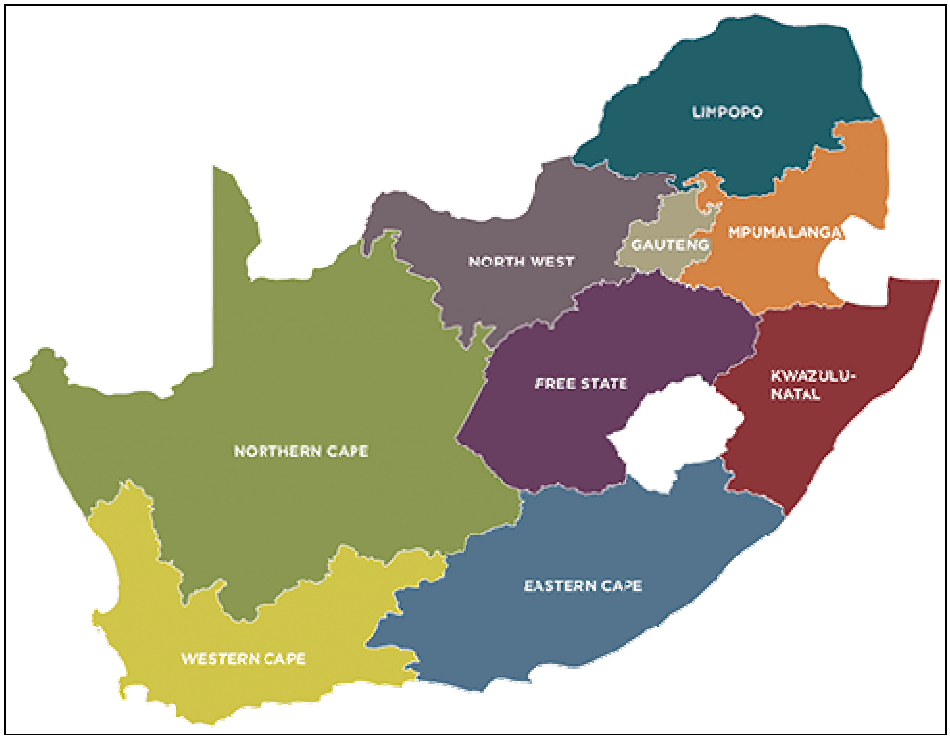

Figure 6: Location of the North West Province in South Africa (Source: Local Government Handbook, 2012)

4.1.2. Dr Ruth Segomotsi Mompati District Municipality (DRSMDM)

Dr Ruth Segomotsi Mompati District Municipality (DRSMSM) is one of the four districts of the North West Province (see Figure 7). The district municipality covers the following local municipalities: Naledi, Greater Taung, Kagisano-Molopo, Mamusa and Lekwa-Teemane. The seat of the district is the town of Vryburg. The DRSMDM has a population of ~439 637 people which is 13.2% of North West Province's population. Majority of the population speak Setswana (Census, 2011). The DRSMSM is South Africa's largest beef producing district, with Hereford cattle being the most popular. Maize and peanuts are important crops produced in the district (Local Government Handbook, 2012).

The settlement pattern in the DRSMDM is fragmentary with small, low-intensity urban areas scattered throughout and surrounded by vast rural areas. The more urban areas, or towns, comprise of higher density settlements with mainly a residential character, except for the only regional urban centre or node, being Vryburg, which has a mix of land uses, varying from residential, retail, institutional to manufacturing and industrial. The major towns are surrounded by very low-density, scattered rural settlements, villages and vast rural areas. The DRSMDM area is described to be the rural hinterland of the North West Province (DRSMDM IDP 2015/2016). The main towns in the district include: Amalia, Bloemhof, Christiana, Piet Plessis, Pomfret, Pudimoe, Reivilo, Schweizer-Reneke, Stella, Taung and Vryburg. The primary economic sectors are as follows: community services (33.1%), agriculture (17.1%), finance (16.2%), trade (12.7%), transport (9%), manufacturing (4%), mining (3.2%), and construction (3.2%).

Figure 7: Location of the Dr Ruth Segomotsi Mompati District Municipality within the North West Province

4.2. Local Context

4.2.1. Naledi Local Municipality (NLM)

The NLM is situated in the DRSMDM in the North West Province (see Figure 8). The NLM covers an area of approximately ~7 264 km² and is divided into nine wards. This land mass is 15% of the total area of the DRSMDM area. The NLM is separated into the following main places, namely; Vryburg town, Huhudi Township, Colridge Township, Stella, Devondale and Dithakwaneng village. The two primary towns in the area include Vryburg and Stella.

Figure 8: Location of the Naledi Local Municipality within the Dr Ruth Segomotsi Mompati District Municipality

Agriculture and hunting are the strongest contributors to the municipality's economy, jointly responsible for 21% of employment. Other important job creating sectors are finance and insurance (8%), public administration (8%), health and social (5.8%) and transport (5%). This makes the municipality the main employer within the district and most significant contributor to GDP. According to the NLM IDP 2015/2016, the NLM is an agriculture-based municipality and falls within the Extensive Agricultural Development Zone. The NLM has a strong beef breeding industry and most of the income is derived from the agricultural sector. The NLM has a strong contribution of agriculture– especially cattle production – to the municipality's GDP. The NLM is identified as a Priority Two Investment Area in terms of the Provincial Spatial Development Framework serving as the:

- » Hub for regional growth needs
- » Main trading centre in the district
- » Main district administrative centre

The NLM is located on the intersection of the Western Frontier and R34 Transport Corridor. Good national road and rail infrastructure is present within the area. However the N18 road between Vryburg and Stella is often congested with trucks.

General baseline characteristics and challenges of the NLM are as follows (Census, 2011 & NLM IDP 2015/2016):

- » The municipality has a population of ~66 781 which is 14.4% of the total population of the DRSMDM.

- Of the ~66 781 population, about 49.83% are female, while 50.17% are male.
- In the NLM there are approximately ~18 572 households with an average household size of ~3.4 persons per household. Of the ~18 572 households in NLM approximately 82% live in formal dwellings.
- More than 74% of the population comprise the Black African ethnic group.
- The most spoken language in the NLM is Setswana (68.8% of the population).
- The Economically Active Population (EAP) (individuals that are aged 15-64 that are either employed or actively seeking employment) accounts for 64% of the entire population.
- The population aged 0–14 years comprise 31% of the population and those aged 65 years and above accounts for 5% of the entire municipal population.
- The dependency ratio is the amount of individuals that are below the age of 15 and over the age of 64, that are dependent on the EAP. The dependency ratio in the NLM comprises 36% of the population.
- There are low levels of literacy amongst the members of the community. The level of education influences growth and economic productivity of a region. In the NLM 16.6% of the population have no schooling, 22% have completed matric and only 9.1% of the population have higher education. This means that majority of the population have a low-skill level and would need job employment in low-skill sectors.
- The municipality's unemployment rate stands at 26.4% (2011).
- Households that have either no income or low income fall within the poverty level (R0- R38 200 per annum) accounts for 66.9%. A middle-income is classified as earning between R38 201 - R307 600 per annum. Approximately 28.2% of the households earn a middle income and 4.9% of households earn a high income that is classified as earning R307 601 or more per annum. A high percentage of household income falls within the poverty level. The high poverty level has social consequences such as not being able to pay for basic needs and services.
- Approximately 63.9% of the population have access to electricity. For all the population that has access to electricity; 77% use it for lighting, 50.7% use it for heating and 64.5% for cooking.
- Approximately 69% of households within the municipality have access to a flush toilet. Approximately 11.8% of the population are using a pit toilet and 4.5% of households use the bucket toilet system.
- 69.7% of the municipal households have their refuse disposal removed by the municipality, whereas only 20.5% use their own refuse dump.
- 97% of households have access to piped (tap) water. From this percentage, 40.9% have access inside their dwelling units, 37% inside their yards, 14% access tap water on a community stand that is a distance

of less than 200m from their yards, 3% travel between 200m and 500m to access tap water.

- The NLM faces challenges with the lack of upgrading and maintenance of infrastructure. Industries are hesitant to locate in the NLM due to the inefficient and haphazard supply of basic services such as water and electricity.
- The NLM has a declining economy despite being the most diverse economy in the district.
- The NLM does not have a detailed settlement plan for rural villages. There are also limited business and SMME development infrastructure within the rural villages. The NLM also lacks a proper Land Use Management System.
- The NLM lacks rental housing units which discourages skilled and professional people from coming into the area.
- The NLM has an underdeveloped tourism sector and no local tourism strategy.
- Availability and affordability of land/business space in Vryburg is a constraint especially for emerging entrepreneurs and business initiatives.

The greatest social problems in the NLM are illiteracy, poverty and lack of basic service infrastructure. The NLM has a declining economy. The income distribution is distorted in the NLM to the disadvantage of the less economically secured people, who also represents the majority of the municipal area. Poor households are a result of a lack of wage income, either due to unemployment or low-paying jobs. Access to basic services such as electricity, toilets and piped water is also closely correlated with poverty.

4.2.2. Direct area of influence

The proposed facility may affect the major service providers which include the local municipality and local businesses in the area. The local municipality that will be directly impacted by the proposed PV facility will be NLM. The municipality will absorb a number of social impacts (positive and negative), especially impacts related to an influx of people, since they will be responsible to deliver services to people residing within their municipal area. Negative dimensions of impacts such as the influx of jobseekers into the area putting pressure on the provision of basic services and poverty level will need to be assessed.

The proposed facility will however contribute towards social and economic development through enabling skills development and training in order to empower individuals and promote employment creation within the local area. The facility would mainly focus on economic benefits to the area and introduce a new industry into the local economy. There are a number of local businesses in

the area that could benefit from the proposed PV facility in terms of an increase in demand for goods and services (positive cumulative impacts).

According to WWF (2015), renewable energy projects under the Renewable Energy Independent Power Producer Procurement (REIPPP) Programme are obliged to make a real contribution to local economic development in the area. These requirements have to be fulfilled within a 50km radius of the project site and renewable energy companies are obliged to engage with the development opportunities and needs of communities around the project site. Awarded projects are required to spend a certain amount of their generated revenue on Socio-Economic Development (SED) and Enterprise Development (ED) and share ownership in the project company with local communities. These criteria, as well as the creation of a specific number of jobs, are incentivised through awarding higher scoring to projects that realise such criteria within a 50km radius to the project site during the evaluation process. Additionally, projects add value to the local economy through targeted procurement from local businesses. Job creation requirements target national and local citizens. Between 12% and 20% of the people employed on each project have to be residents of local communities located within 50km of the project site. Only "in the event that there are no residential areas or villages within 50km from the project site (are project developers allowed to source workers) in the nearest residential areas or villages to the project site" (DoE 2011). The DoE indicates that the programme offers great potential to realise positive socio economic outcomes- such as job creation, local ownership, socio-economic development and enterprise development. The project's direct area of influence will extend to a 50km radius from the proposed site. The closest urban areas to the proposed site within the project's direct area of influence (within 50km radius) include Vryburg, Stella and Schweizer-Reneke;

» *Vryburg*: is located in the NLM approximately 10km north west of the proposed PV facility and covers an area of ~64.24km^2. Vryburg has a total population of approximately ~21 182 people and approximately ~5 521 households (Census, 2011). Around 40.82% of the population are black African and 37.58% coloured. The primary languages spoken in the town is Afrikaans (56.33%) and Setswana (33.04%). The administrative centre of the municipality is in the town of Vryburg. Vryburg is South Africa's largest beef producing district, with Bonsmara cattle being the most popular. It is sometimes called "the Texas of South Africa". The town hosts South Africa's third largest agricultural show, namely Vryburg Show, which attracts farmers from almost all Provinces in the country as well as farmers from the neighbouring countries such as the Republic of Namibia and Botswana. The town today is a thriving industrial and agricultural hub. Its modern architecture blends naturally with its surroundings and the well-preserved old buildings are carefully maintained. There are excellent roads, rail and air connections to all the

major centres in the country. Vryburg is also situated on the main railway lines from Cape Town to Botswana and Zimbabwe. The town offers residential areas, business centres and all modern facilities

» *Stella*: is a small town located in the NLM, 45km north east west of the proposed site. Stella covers an area of ~9.06km^2 and has a population of approximately 890 people. Stella is a cattle farming town and is widely known as the host of the annual Cattle Festival held in October.
» *Schweizer-Reneke*: is located in the Mamusa Local Municipality in the DRSMDM. The town is located approximately 48 km south east of the proposed site. The town covers an area of ~2 275km^2 and has a population of ~41 226 people. The principal crops of the region around Schweizer-Reneke are mainly maize, sorghum, groundnuts and sunflower seeds. In addition, cattle and sheep farming is practiced in the region on a relatively large scale on grasslands where the soil is unsuitable for cultivation. Schweizer-Reneke is rich in diamond deposits. This led to large scale private diamond mining in the area.

There are also a number of smaller rural settlements / villages within the direct area of influence such as, Huhudi Township, Colridge Township, Devondale and Dithakwaneng village.

The situational analysis and statistics presented in the baseline description of the NLM indicate the developmental challenges facing the municipality, such as poverty, unemployment, and service delivery backlogs. Socio-economic spin-offs from the proposed PV facility could contribute to better infrastructure provision and educational investment in the local areas. However an in-depth community needs assessment (CNA) will need to be carried out at a later stage to ensure that the real needs of communities are addressed (in line with the local government) by development programmes in order to significantly contribute towards local economic growth, SED and ED. The development of the proposed PV facility has the potential to contribute towards positive socio-economic improvements within the local area. Potential negative impacts on these towns will be during the construction phase and will be associated with pressure on infrastructure (e.g. health facilities, basic services) and different social/cultural behaviour influences; from an external workforce being brought into the local area. The positive social impacts associated with the proposed PV facility for the surrounding towns include economic growth and development (economic opportunities such as jobs and expenditure in the local area).

4.2.3. Indirect areas of influence

The indirect areas of influence extend to all areas that will be indirectly affected by the development of the proposed PV facility. There are a number of stakeholders that reside outside the direct area of influence but who may be

affected by the proposed facility. These include road users that use the N18 or R34 on a frequent basis as part of their daily or weekly movement patterns. Construction vehicles and trucks may be utilising these roads during the construction phase which will increase the traffic and may increase the wear and tear on these roads. The number of heavy vehicle trips per day would be approximately 15 - 20 trips for the duration of the construction phase (12-18 months) for the PV facility. Also the low and semi-skilled workers will likely be transported to site with busses. The facility will also have an indirect effect on the town's local residents; with a possible influx of in-migrants and growth in the local economy.

4.3. Immediate area of influence

The immediate area of influence includes the site and adjacent landowners in order to include any immediate social receptors that may be impacted by the proposed activities. Sensitive social receptors to the proposed project may include farmers residing on their farms, workers living on the farms and tenants residing in farmhouses on the farms. There are potentially vulnerable farming activities in the study area (livestock and game farming). The most sensitive farming community/ activities are those that are located within the site and directly adjacent.

4.3.1. Site Context

This section will describe the land use character of the impacted site. The PV facility is proposed to be located on privately owned land, on the Remaining Extent of Farm Woodhouse 729. The proposed PV facility site lies approximately 10 km south east of Vryburg in the North West Province. The site is located within a livestock farming agricultural region. The affected property is approximately ~2 264ha however the PV facility footprint and associated infrastructure will be less than 300ha in extent. A semi-structured interview was held with the impacted landowner of Farm Woodhouse RE/729. Prominent characteristics within the affected property include (see Figure 9):

- The property is currently utilised for low density livestock farming by the landowner.
- The landowner will lease sections of his farm for the PV facility (Farm Woodhouse RE/729) to the developer for the development of Woodhouse Solar 2 PV facility.
- The landowner noted in the semi-structured interview that the surrounding areas to the proposed PV facility will be utilised to continue his current livestock farming activities. Thereby the solar energy development will not interfere with his livestock farming operations.
- The impacted landowner's farmstead is located north of the R34 approximately 1km north east of the Eskom substation.

- » There are old vacant buildings located in the southern portion of the impacted farm near the Amalia unsurfaced secondary road.
- » The property is surrounded by similar agricultural land, used predominantly for sheep, cattle and game farming.
- » The R34 regional road traverses the northern portion of the affected property.
- » The Amalia unsurfaced secondary road traverses the western boundary of Farm Woodhouse RE/729.

4.3.2. Adjacent Landowners

Majority of the surrounding study area has a low number of farmsteads/buildings that are sparsely populated. The study area is located within a livestock farming agricultural region near the town of Vryburg. Figure 9 illustrates the adjacent landowner's locations relative to the affected property associated with the development of the Woodhouse Solar 2 PV Facility. There is potential for the proposed PV facility to negatively impact adjacent landowners. A survey of the adjacent landowners was undertaken to determine the type of activities/land uses surrounding the site and to determine any sensitive social receptors that may be negatively impacted by the proposed PV facility (see minutes of meetings in Appendix C). Majority of the land surrounding the proposed site for the development comprises large open spaces / agricultural areas. Prominent features surrounding the affected property includes (also see Figure 9):

- » Primarily agricultural activities take place on adjacent farms, primarily livestock farming and minor game farming takes place in the local area.
- » During the stakeholder consultations it was determined that there are very few homesteads located near the site proposed for the development of the PV facility and the impact on these homesteads will be minor (see minutes of meetings in Appendix B).
- » The surrounding area is sparsely populated. Figure 9 indicates the position of buildings/dwellings located within the adjacent farm properties.
- » Vryburg town is located 10km north west of the proposed PV facility site.
- » An Eskom substation is located on Farm Bernauw 56/674 and the landowner of that farm also runs a guesthouse.
- » The R34 road traverses the northern portion of the proposed PV facility site and the Amalia unsurfaced secondary road is located to the west of the site.
- » The N18 national road and two railway lines are located approximately 3-4km west of the site proposed for the PV facility.

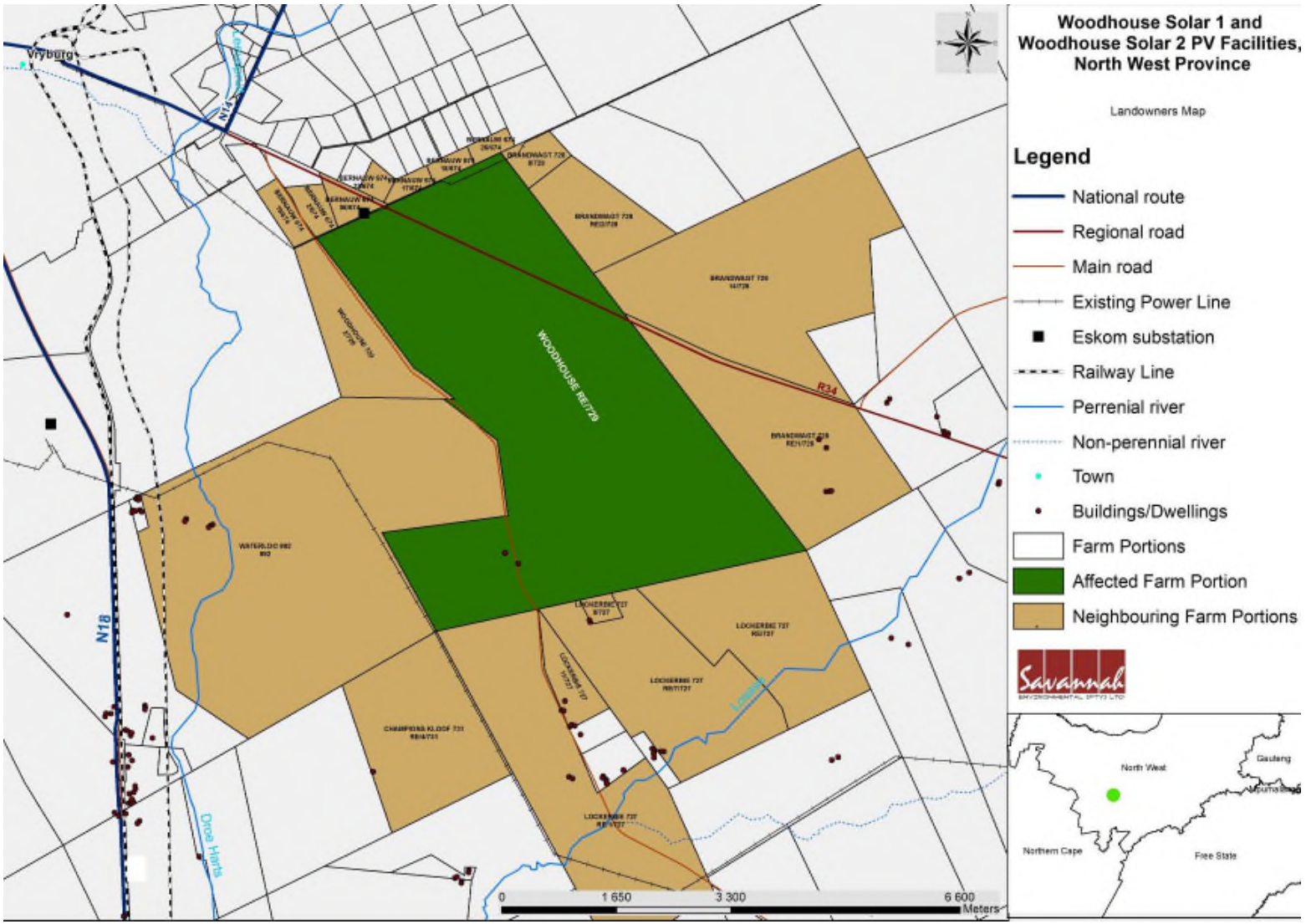

Figure 9: Landowners map for Woodhouse Solar 2 PV facility

4.4. Stakeholder Identification and Analysis

Stakeholders are defined as "any group or organisation which may affect or be affected by the issue under consideration (UN, 2001: 26)". These may be direct or indirect stakeholders and may include organisations, institutions, groups of people or individuals, and can be at any level or position in society, from the international to the national, regional, household level (Farnke & Guidero, 2012). Stakeholders are those who need to be considered and whose participation and support are crucial to achieving the success of the project goals.

Stakeholder analysis involves identifying the key stakeholders associated with the project. The first step in the process of stakeholder analysis is stakeholder identification; determining who the project stakeholders are, and their key grouping and sub-groupings (IFC, 2007). Identifying stakeholders that are directly and indirectly affected by the project is important to determine who might be affected and in what way. The key stakeholders associated with the proposed PV facility have been identified and grouped / sub grouped (as per Ilse Aucamp SIA methodology & Aucamp et al, 2011) in Figure 10 below. Immediate, direct and indirectly affected stakeholders associated with the proposed facility have been identified. Directly affected stakeholders are sensitive social receptors that may potentially be affected by the proposed facility; this relates to the locations of sensitive receptors. A sensitive receptor is an area or structure sensitive to a predicted social impact. Potentially sensitive receptors that might be impacted on by the proposed PV facility include dwellings and other sensitive properties such as schools, hospitals, places of worship and other community facilities.

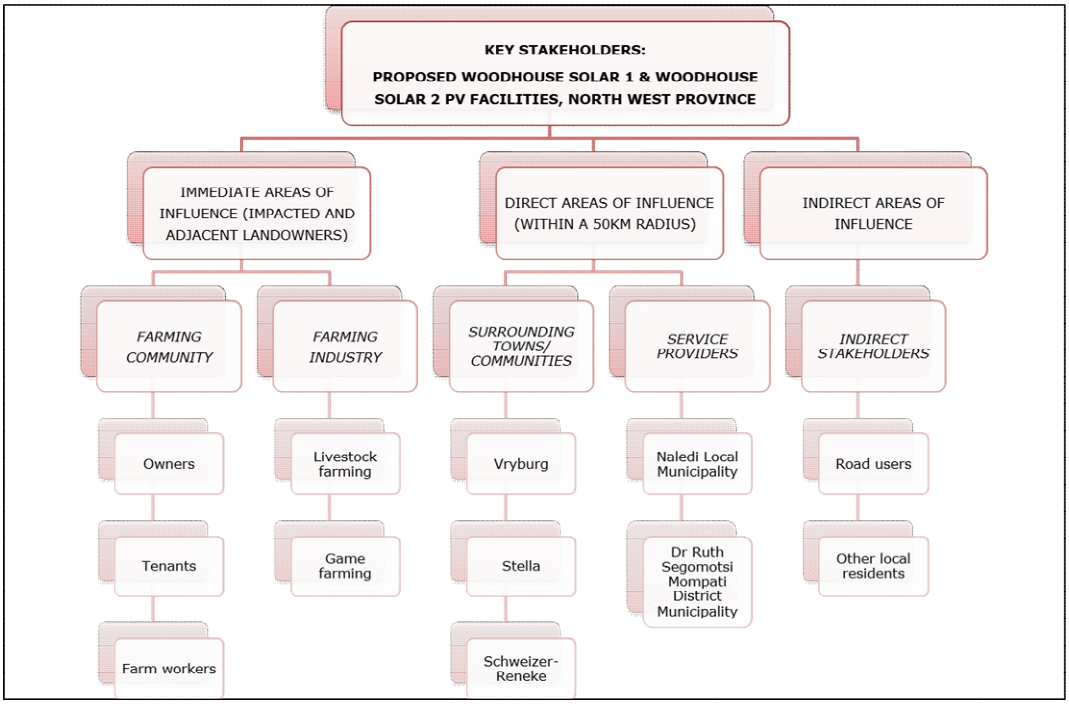

Figure 10: Key stakeholders associated with the proposed PV facility

A description of each of the stakeholders groups in relation to the proposed PV facility is discussed in the section below:

» *Farming community:* the farming community have been grouped into three categories, namely- farm owners, farm tenants and farm workers. Farm owners include farmers who own the land and make a living from their properties. Farm tenants are people who rent the land and work on the land for income. Lastly the farm workers, people who work and may also live on the farms (farm workers and their families). The farming community consists of the larger farms in the study area.

» *Farming industry:* There are vulnerable farming activities in the study area. The primary agricultural activity is livestock and game farming. Impacts that may arise include stock theft and poaching from an increase of in-migrants in the area (especially during the construction phase).

» *Surrounding towns / affected communities:* Vryburg is the closest town to the proposed site located approximately 10km north west. Residents in these towns may be positively and/or negatively affected by the proposed PV facility (mainly temporarily). Employment opportunities will be available for the proposed PV facility and it is probable that some of the labour will be sourced from the local area; this will be a positive impact for the local community.

» *Service providers:* The major service providers which will be affected by the project include the district and local municipalities and local businesses in the area. The local municipality that will be directly impacted by the proposed PV facility will be the Naledi Local Municipality (Ward 5). The municipality will absorb a number of social impacts (positive and negative), which may relate to a marginal influx of people coming into the area, since they will be responsible to deliver services to people residing within their municipal area. There are a number of local businesses in the area that could benefit from the proposed PV facility in terms of an increase in demand for goods and services.

» *Stakeholders outside the direct area of influence:* There are a number of stakeholders that reside outside the direct area of influence but who may be marginally affected by the project. These include road users that use the R34 and secondary local gravel roads on a frequent basis as part of their daily or weekly movement patterns. Construction vehicles and trucks will be utilising these roads during the construction phase, which will increase the traffic, noise and dust, create traffic disruptions and may increase the wear and tear on these roads.

5. SOCIAL IMPACT ASSESSMENT

This section provides a detailed description and assessment of the potential social impacts associated with the construction, operation and decommissioning phases of the proposed Woodhouse Solar 2 PV Facility and associated infrastructure. Cumulative impacts are assessed within Section 5.3.

5.1. Construction Phase

Impacts associated with the construction phase of the project are usually of a short duration (approximately 12-18 months) and temporary in nature, but could have long-term effects on the surrounding social environment if not managed appropriately.

5.1.1. Direct employment and skills development

The construction of the proposed project will require a workforce and therefore direct employment will be generated. The proposed PV facility will create employment opportunities for the local community. It is estimated that during the construction phase (for the period of approximately 12-18 months) approximately ~300-400 employment opportunities will be generated for the proposed PV facility. In terms of skills requirements, it is common that highly skilled or skilled labour such as engineers, technical staff and project managers will constitute about 15% of the work force; skilled staff would typically be required to operate machinery and will constitute about 25% of employees, while unskilled staff such as construction and security workers will constitute about 60% of the work force. Employment opportunities for the proposed PV facility will peak during the construction phase and significantly decline during the operation phase. The estimated salary and wage bill will equate to approximately R50 million (2016 Rand value).

Under the REIPPP Programme, developers are obliged to make a real contribution to local economic development that is to be fulfilled within a 50km radius of the project site (WWF, 2015). Awarded projects are required to employ between 12% and 20% of residents from local communities (located within 50km of the project site). Only "in the event that there are no residential areas or villages within 50km from the project site (are project developers allowed to source workers) in the nearest residential areas or villages to the project site" (DoE 2011). The DoE indicates that the programme offers great potential to realise positive socio economic outcomes- such as job creation, local ownership, SED and ED. The project's direct area of influence will extend to a 50km radius from the proposed site. The main urban area located within the 50km radius is Vryburg.

There will be significant job opportunities available for low skilled (construction, security, and maintenance workers) and semi-skilled workers, which can be sourced from the local area. The proponent has indicated that ±200 low-skilled and semi-skilled opportunities are likely to be available to the local labour force. Construction workers could be sourced from the nearest local settlements and towns such as Vryburg. It could be expected that some of the workers from outside the local area would form part of the construction team. Local labour should be sourced from within the 50km radius first and if need be extend the search to the DRSMDM or nationally. Adverse impacts could occur if a large in-migrant workforce, culturally different from the local communities within local area are employed and brought in during the construction phase. While the local labour pool may be qualified for less-skilled jobs, often local hiring will not meet the demands in professional, technical and supervisory areas. A number of specialist contractors would most likely be brought in from other areas.

The developer will need to demonstrate a commitment to local employment targets in order to maximise the opportunities and benefits for members of the local community. It is likely that an Engineering, Procurement and Construction (EPC) contractor will be appointed by the developer who will hire the necessary employees. The applicant has indicated that training will also be provided to employees during the construction phase of the proposed PV facility. Specific skills training for local communities have the opportunity to develop local employee potential. This is crucial to long-term development of skills and education in the area. This will accelerate the positive benefits and impacts of the development on the economy.

Table 5: Impact assessment on direct employment opportunities and skills development

Construction Phase		
Nature: The creation of employment opportunities and skills development opportunities during the construction phase for the country and local economy		
	Without enhancement	**With enhancement**
Extent	Local- Regional (3)	Local- Regional (3)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Moderate (6)
Probability	Highly probable (4)	Highly probable (4)
Significance	**Medium (36)**	**Medium (44)**
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources	N/A	
Can impacts be enhanced	Yes	
Enhancement measures: » If possible, efforts should be made to employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.		

» It is recommended that local employment policy is adopted to maximise the opportunities made available to the local labour force (sourced from nearest towns/settlements). » The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. » Where feasible, training and skills development programmes should be initiated prior to the commencement of the construction phase. » A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained by the Contractor and monitored by the ECO to record all complaints and queries relating to the project and the action taken to resolve the issue.
Residual impacts » Improved pool of skills and experience in the local area. » Economic growth for small-scale entrepreneurs. » Temporary employment during construction phase will result in jobs losses and struggles for local construction workers to find new employment opportunities post construction.

The impact is therefore assessed to be positive, local and regional in extent, temporary in duration, of moderate intensity, and highly probable with enhancement measures implemented. The impact is assessed to be of **medium significance** to the decision making process.

5.1.2. Economic multiplier effects

There are likely to be opportunities for local businesses to provide services and materials for the construction phase of the development. The local service sector will also benefit from the proposed PV facility. The site is located approximately 10km south east of Vryburg in the North West Province. Given the relative proximity of the site to Vryburg, the proponent has indicated that no on-site accommodation is envisaged for the construction phase. Employees will be sourced from the local areas (where possible) and those who have been sourced out of town will be transported to and from site for the duration of the construction phase from their place of residence. Off-site accommodation in the nearest towns would be required for contract workers and certain employees. The economic multiplier effects from the use of local goods and services opportunities will include, but is not limited to, construction materials and equipment and workforce essentials such as services, safety equipment, ablution, accommodation, transportation and other goods.

The total construction capital expenditure associated with the establishment of the solar energy facility and associated infrastructure is estimated to be in the region of R5.5-7 billion (2016 Rand value). Some of the capital expenditure will

be spent on local goods and services required for the development of the solar energy facility. In terms of business opportunities for local companies, expenditure during the construction phase will create business opportunities for the regional and local economy. The increase in demand for new materials and services in the nearby area may stimulate local business and local economic development (however locally sourced materials and services may be limited due to availability). There is likely to be a direct increase in industry and indirect increase in secondary businesses.

Also the injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area. Through the stimulation of employment and income is the creation of new demand within the local and regional economies. With increased income comes additional income for expenditure on goods and services supplied. The intention is to maximise local labour employment opportunities, this is likely to have a positive impact on local communities and have downstream impacts on household income, education and other social aspects. The implementation of the enhancement measures below can increase the opportunities for the local area.

Table 6: Economic multiplier effects impact assessment

Construction Phase		
Nature: Significance of the impact from the economic multiplier effects from the use of local goods and services		
	Without enhancement	**With enhancement**
Extent	Local- Regional (4)	Local- Regional (4)
Duration	Short term (2)	Short term (2)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	**Medium (30)**	**Medium (36)**
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources	N/A	
Can impacts be enhanced	Yes	
Enhancement » It is recommended that a local procurement policy is adopted by the developer to maximise the benefit to the local economy. » Where feasible, the developer should create a database of local companies, specifically Historically Disadvantaged (HD) which qualify as potential service providers (e.g. construction companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction contractors; these companies should be notified of the tender process and invited to bid for project-related work where applicable. » It is recommended that goods and services are sourced from the local area as much as		

possible; engage with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers, where feasible.
Residual impacts Improved local service sector, growth in local business

The impact is assessed to be positive; local to regional in extent; temporary in duration; moderate intensity; and highly probable. The impact is assessed to be of a **low-medium significance** to the decision-making process.

5.1.3. Influx of jobseekers

The proposed PV facility will create a range of employment possibilities and thus this will attract jobseekers. An influx of people looking for economic opportunities could result in pressure on economic and social infrastructure on the local population (rise in social conflicts and change in social dynamics). Influx of jobseekers into the area, could lead to a temporary increase in the level of crime, cause social disruption and put pressure on basic services. Influx of jobseekers could potentially create conflict between locals and outsiders mainly due to difference in racial, cultural and ethnic compositions. The high unemployment rates and expectations of job creation is already a potential source of competition among locals and could be exacerbated through outsiders coming into the area resulting in conflict. A further negative impact that could result due to an inflow of jobseekers is that local unemployment levels could rise due to an oversupply of an available workforce, particularly with respect to semi and unskilled workers.

The towns and settlements located the closest to the proposed PV facility site (i.e. Vryburg) is seen as a sensitive social receptor and jobseekers coming into the area could put pressure on social infrastructure; create social problems, tensions and conflicts. The impact associated with in-migration of jobseeker includes pressure on local services and infrastructure. This includes municipal services such as sanitation, electricity, water, waste management, health facilities, transportation and availability of housing. Informal settlements may develop near towns to accommodate jobseekers. It is very difficult to control the influx of people into an area, especially in a country where there's high levels of unemployment. An influx of jobseekers to an area often results in an increase in prostitution activities and temporary sexual relations with locals; this could result in the spreading of HIV/Aids and STDs and unwanted pregnancies. The proposed solar development disrupting societies largely depends on the level of local employment achievable and clearly stipulating a local employment regime to limit outsiders coming into the area. Employment opportunities can be sourced from the surrounding local towns and settlements first, i.e. Vryburg, if availability of labour is limited then extend the search to the NLM and DRSMDM. The NLM

population (66 781 people) could fulfil the majority of the lower and semi-skilled employment opportunities that emerge from the proposed PV facility.

Table 7: Assessment of impacts from influx of jobseekers in the local area

Construction Phase		
Nature: Added pressure on economic and social infrastructure and an increase in social conflicts during construction as a result of in-migration of jobseekers		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	**Low (24)**	**Low (18)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	

Mitigation

» It is recommended that local employment policy is adopted to maximise the opportunities made available to the local labour force.
» A 'locals first' policy should be adopted for construction employment opportunities, especially for semi and low-skilled job categories. Enhance employment opportunities for the immediate local area; (i.e. Vryburg), and if this is not possible, then the broader focus areas should be considered for sourcing workers such as NLM and DRSMDM.
» Tender document should stipulate the use of local labour as far as possible.
» Prior to construction commencing representatives from the local community (e.g. ward councillor, surrounding landowners) should be informed of details of the construction schedule and exact size of the workforce.
» Recruitment of temporary workers at the gates of the development should not be allowed. A recruitment office should be established by the contractor in a nearby town to deal with jobseekers.
» A security company is to be appointed and appropriate security procedures to be implemented.
» Establish procedures for the control and removal of loiterers at the construction site.
» A comprehensive employee induction programme should address issues such as HIV/ AIDS and sexually transmitted diseases. The induction should also address a code of conduct for employees that would align with community values.
» A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained by the Contractor and monitored by the ECO to record all complaints and queries relating to the project and the action taken to resolve the issue.

Residual impacts

Possibility of outside workers remaining in the area after construction is completed and subsequent pressures on local infrastructure and services.

The impact is assessed to be negative; local in extent; temporary in duration; moderate intensity; and improbable with mitigation measures. The impact is assessed to be of **low significance** to the decision-making process.

5.1.4. Impacts on daily living and movement patterns (traffic impacts)

An increase in traffic due to construction vehicles and heavy vehicles could create short-term disruptions and safety hazards for current road users. Transportation of project components and equipment to the proposed site will be transported using vehicular / trucking transport. The internal access road onto the site will be located off the existing secondary unsurfaced road, known as the Amalia road, located approximately ~7km south of the R34. The access road will run along the western boundary of Farm Woodhouse RE/729; this will be the main access road used to access the proposed site. The primary roads that will be used for transportation of project components and equipment will be the R34 and the Amalia gravel access road that is located off the R34. Increased traffic due to construction vehicles and heavy vehicles could cause disruptions to road users and increase safety hazards. The use of local roads and transport systems may cause road deterioration and congestion. This impact will be magnified since gravel roads are not designed to carry heavy traffic and are prone to erosion. An increase of traffic from the rise in construction vehicles is a safety concern for other road users and local communities in the area.

The developer has indicated that the number of construction vehicle trips per day would be in the region of ~15-20 trips. There will be an increase in the movement of people during the construction phase. Low and semi-skilled workers will likely be transported to site with busses. Noise, vibrations, dust and visual pollution from construction vehicles and heavy vehicle traffic during the construction phase could cause temporary disruptions in daily living, movement patterns and quality of life for local community members. There are only a few and sparsely populated homesteads or residents living in the nearby area, which reduces this impact. The surrounding farms are primarily utilised for livestock and minor game farming activities.

Table 8: Assessment of impact on daily living and movement patterns (traffic impacts)

Construction Phase		
Nature: Impacts from an increase in traffic disruptions and movement patterns during the construction phase		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Low (4)

Probability	Probable (3)	Improbable (2)
Significance	**Medium (30)**	**Low (16)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	
Mitigation » All vehicles must be road worthy and drivers must be qualified, obey traffic rules, follow speed limits and made aware of the potential safety issues. » Heavy vehicles should be inspected regularly to ensure their road safety worthiness. » Implement penalties for reckless driving for the drivers of heavy vehicles as a way to enforce compliance to traffic rules. » It is the developer and engineering, procurement and construction (EPC) contractor's responsibility to ensure that the roads utilised are either maintained in the present condition or upgraded if disturbed due to project activities. » A comprehensive employee induction programme must be implemented to cover land access protocols and road safety. » A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained by the Contractor and monitored by the ECO to record all complaints and queries relating to the project and the action taken to resolve the issue.		
Residual impacts None anticipated		

The impact is assessed to be negative; local in extent; temporary in duration; low intensity and improbable with mitigation measures. The impact is assessed to be of **low significance** to the decision making process.

5.1.5. Safety and security impacts

The perceived decline of security during the construction phase of the proposed project due to the influx of workers and/ or outsiders to the area (as influx of newcomers or jobseekers are usually associated with an increase in crime) may have indirect effects, such as increased safety and security risk for neighbouring properties and damage to property, increased risk of veld fire, stock theft, crime and so forth. The perception exists that construction related activities (influx of jobseekers, and construction workers and so forth) is a contributor to increased criminal activities in an area. Safety and security impacts are a reality in South Africa which needs to be addressed through appropriate mitigation and management measures. All of the farms in the study area are utilised for livestock farming and/or game farming, therefore the development coming into the rural area may expose these farming activities to potential stock theft and poaching. During the stakeholder consultation process it was noted that stock

theft and crime is already a major problem in the area. There are no residents living in or near the proposed site. The affected site associated with the development of the PV facility is currently utilised for livestock farming.

The impacted and adjacent farm owners utilise their farms for livestock and/or game farming. There are also minor game farming activities on nearby farms. The influx of construction workers and people coming into the area does increase the risk of stock theft and poaching.

The portion of land (i.e. development area) identified by the developer for the construction and operation of the proposed PV facility and associated infrastructure will be leased from the landowner. The landowner currently utilises the farm for livestock grazing and the farm is securely fenced around the boundary. The landowner will continue his grazing activities on the areas of his farm that aren't utilised for the proposed PV facility. The proposed access road and entrance gate will be located off the secondary unsurfaced road, known as the Amalia road, and will be 4m wide for heavy construction vehicles and trucks carrying abnormal loads that will require access to the site. As a result of the construction of the access road off the Amalia road this may negatively impact the fences and gates on farm Woodhouse RE/729. Infrastructure such as roads, fencing and gates should either be maintained in the present condition, repaired, or improved upon if disturbed due to project activities. Currently the farm is utilised for livestock grazing. The areas associated with the project (i.e. internal roads and proposed site) would need to be fenced off for security reasons and safety of livestock crossing over the internal access roads. It would be necessary for there to be an access control point at the entrance of the access road on Farm Woodhouse RE/729 off the Amalia road, to ensure that the access gate is controlled.

It is viable for the appointed EPC contractor to implement appropriate security measures. It is therefore recommended that the appointed EPC contractor takes these points into consideration and it is important that a security company is appointed and appropriate security procedures and measures implemented.

An increase of traffic from the rise in construction vehicles is a potential safety concern for road users and local communities in the area. The movement of construction related activities crossing over the R34 to access the Amalia road, does have the potential to increase the risk for road users. Also with wear and tear on roads that is not maintained / repaired; the safety risk also increases. The R34 and the Amalia road would mainly be affected and the use of un-roadworthy vehicles, drivers disobeying traffic rules and the obstruction of motorist's views will contribute to this potentially negative impact.

Table 9: Assessment of safety and security impacts

Construction Phase		
Nature: Temporary increase in safety and security concerns associated with the influx of people during the construction phase		
	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Short term (2)	Short term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Improbable (2)	Very improbable (1)
Significance	**Low (27)**	**Low (14)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	

Mitigation

» Working hours should be kept within daylight hours during the construction phase, and/or as any deviation that is approved by the surrounding landowners.
» The perimeter of the construction site should be appropriately secured. The fencing of the site should be maintained throughout the construction periods.
» The appointed EPC contractor must appoint a security company and appropriate security procedures and measures are to be implemented.
» Access in and out of the site should be strictly controlled by a security company.
» Provide workers with identity tags and prohibit the access of unauthorized people to the construction site.
» The developer and engineering, procurement and construction (EPC) contractors must ensure that there is a dedicated safe entrance to the site, and an access control point at the entrance gate on Farm Woodhouse RE/729.
» The developer and engineering, procurement and construction (EPC) contractor's must ensure that the fencing or entrance gates along the access road must either be maintained in the present condition, improved upon or repaired if disturbed due to project activities.
» The contractor must ensure that open fires on the site for heating, smoking or cooking are not allowed except in designated areas.
» Contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff.
» The developer and engineering, procurement and construction (EPC) contractors must ensure that any damage / wear and tear to the roads caused by construction related traffic/ project activities are repaired
» Provision of adequate and strategically placed traffic warning signs and control measures along the access road and R34 to warn road users of the construction activities taking place and displaying road safety messages and speed limits. Warning signs must be visible at all times.
» A comprehensive employee induction programme, covering land access protocols, fire management and road safety. This must be addressed in the construction EMPr as the best practice.
» All vehicles must be road worthy and drivers must be qualified and made aware of the potential road safety issues and follow the speed limits.
» The contractor should have personnel trained in first aid on site to deal with smaller

incidents that require medical attention. » A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedure and address issues and complaints.
Residual impacts None anticipated

The impact is assessed to be negative; local in extent; temporary in duration; low intensity and improbable with mitigation measures. The impact is assessed to be of **low significance** to the decision making process.

5.1.6. Nuisance Impacts (noise and dust)

Impacts associated with construction related activities include noise, dust and disruption or damage to adjacent properties and is considered as a potential issue. Experience from construction of other solar energy facilities in the area indicate that site clearing and construction vehicles traveling on gravel roads does increase the risk of dust and noise being generated, which can in turn impact on adjacent properties. The potential impacts can be addressed by implementing effective mitigation measures. The primary sources of noise during construction would be from the construction equipment and other sources of noise including vehicle/truck traffic, and general construction activities. Noises levels can be audible over a large distance however are generally short in duration. The generation of dust would come from construction activities as well as trucks/ vehicles driving on the gravel access road (Amalia road) and internal access roads. With the in-migration of people and construction workers into the area, this will also increase noise impacts. This impact will negatively impact social sensitive receptors temporarily. The immediate local area is sparsely populated with a few homesteads located near the proposed site. The area is primarily utilised for livestock farming. The movement of heavy construction vehicles along the gravel access roads has the potential to generate dust pollution. The nuisance impacts from the construction activities are expected to be negative however have a low significance.

Table 10: Assessment of nuisance impacts (noise and dust)

Construction Phase		
Nature: Nuisance impacts in terms of a temporary increase in noise and dust		
	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Minor (2)	Small (1)
Probability	Probable (3)	Probable (3)
Significance	**Low (15)**	**Low (12)**

Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	

Mitigation

- Dust suppression measures must be implemented on a regular basis along the gravel access road and on the proposed site.
- Vehicles used to transport sand and building materials must be fitted with tarpaulins or covers when travelling on roads.
- Speed limits must be imposed on internal roads to limit dust generation.
- Ensure all vehicles are roadworthy, drivers are qualified and are made aware of the potential noise and dust issues.
- A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained by the Contractor and monitored by the ECO to record all complaints and queries relating to the project and the action taken to resolve the issue.

Residual impacts

Damage to roads that is not fixed could affect road users.

The impact is assessed to be negative; local in extent; temporary in duration; low intensity; and probable. The impact is assessed to be of **low significance** to the decision-making process.

5.2. Operation Phase

The solar energy facility is designed to be operational for at least ~20-25 years. The potential positive and negative social impacts which could arise as a result of the operation of the proposed project include the following:

5.2.1. Direct employment and skills development

The operation phase of the project will require a workforce and therefore direct employment will be generated. Although the exact number of permanent workers is not confirmed at this stage, it is estimated that approximately ~60 jobs will be generated for the lifetime of the project (approximately ~20-25 years). Given that solar energy facilities are relatively new in South Africa, a number of highly skilled personnel may need to be recruited from outside the local area. These employees would include skilled engineers (specialised in both electrical and mechanical engineering). Employees that can be sourced from the local municipal pool include the less skilled such as safety and security staff and maintenance crew. Routine activities would include operation of the solar energy facility to produce power, and regular monitoring and maintenance activities to ensure safe and consistent operation. Maintenance will be carried out throughout

the lifespan of the solar energy facility and associated infrastructure. Typical activities during maintenance include washing PV panels routinely (in the evening) and vegetation control and maintenance around the solar energy facility and along the power line route. Employment opportunities will be created during the operation phase and this is rated as positive impact although limited.

It should be encouraged that as many as possible employees be sourced from within the local municipal pool and if the relevant skills are not available then these should be sought out on a regional/ national basis. The proponent will need to demonstrate a commitment to local employment targets in order to maximise the opportunities and benefits for members of the local community. The focus for employment should be on local people, including women; this will have a maximum positive long-term impact (and if there is sufficient transfer of skills the positive impact can be extended). As the employment opportunities generated during the operation phase are more permanent and sustainable in the long run, as opposed to those generated during the construction phase (which are only temporary), sourcing of local labour during this phase will have long term beneficial impact. The applicant has indicated that training will also be provided to employees. Training is crucial to long-term development of skills and education in the area. This will accelerate the positive benefits and impacts of the development on the economy.

Table 11: Employment opportunities and skills development

Operation Phase		
Nature: The creation of employment opportunities and skills development opportunities during the operation phase for the country and local economy		
	Without enhancement	**With enhancement**
Extent	Local- Regional (2)	Local- Regional (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Highly probable (4)	Highly probable (4)
Significance	**Medium (40)**	**Medium (48)**
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources	N/A	
Can impacts be enhanced	Yes	
Enhancement » It is recommended that a local employment policy is adopted to maximise the opportunities made available to the local community. » The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. » Vocational training programs for employees should be established to promote the development of skills.		
Residual impacts		

Improved pool of skills and experience in the local area

The impact is assessed to be positive; local to regional in extent; long-term; moderate intensity and is highly probable. The impact is assessed to be of **medium significance** to the decision-making process.

5.2.2. Development of clean, renewable energy infrastructure

Energy production has been and still is one of the main pivots of the social and economic development of South Africa. South Africa currently relies on coal-generated energy to meet its energy needs. Almost 72% of South Africa's primary energy is from coal, over half used to generate electricity and a quarter used for synfuels production. South Africa's carbon emissions are higher than those of most developed countries partly because of the energy-intensive sectors which rely heavily on low quality coal. The use of low quality coals is the main contributor to GHG emission. The energy-intensive sectors of the economy emit carbon emissions that are higher than those of most developed economies. The use of solar irradiation for power generation is considered a non-consumptive use of a natural resource which produces zero GHG emissions. The generation of renewable energy will contribute to South Africa's electricity market. The advancement of renewable energy is a priority for South Africa. The government considers the use of renewable energy as a contribution to sustainable development (White Paper on Renewable Energy). As most of the sources are local and naturally available, its use will strengthen energy security as it will not be subjected to disruption by international crisis. Furthermore, recent policy highlights the desirability of clean, green energy and solar generated energy will play a significant role in reaching these quotas (Energy Research Centre UCT, 2004). Given South Africa's reliance on Eskom as a power utility, the benefits associated with an Independent Power Producer based on renewable energy are regarded as an important contribution.

Increasing the contribution of the renewable energy sector to the local economy may contribute to the diversification of the local economy and provide greater economic stability. The growth in the solar energy sector could introduce skills and development into the area. The development of a solar energy facility could therefore add to the stability of the economy, and even though this project is small scale in comparison to the overall potential of the sector, it could contribute to the local economy. The overall contribution to South Africa's total energy requirements of the proposed solar energy facility plant is small; however, the 100MW PV facility will help contribute to offset the total carbon emissions associated with energy generation in South Africa.

Table 12: Assessment of the development of clean, renewable energy infrastructure

Operational Phase		
Nature: Development of clean, renewable energy infrastructure		
	Without enhancement	**With enhancement**
Extent	Local- Regional- National (4)	N/A
Duration	Long term (4)	N/A
Magnitude	Minor (2)	N/A
Probability	Highly probable (4)	N/A
Significance	**Medium (40)**	N/A
Status (positive or negative)	Positive	N/A
Reversibility	Yes	
Irreplaceable loss of resources	Yes (impact of climate change)	
Can impacts be enhanced	No	
Enhancement None anticipated		
Residual impacts » Reduce carbon emissions through the use of renewable energy and contribute to reducing global warming. » Contribution towards security of electricity supply.		

The impact is assessed to be positive; local to national in extent; long term; minor intensity; and highly probable. The impact is assessed to be of **medium positive significance** to the decision-making process.

5.2.3. Benefits associated with REIPPP socio-economic development plans and community trust

According the Department of Energy (DoE) renewable energy projects under the Renewable Energy Independent Power Producer Procurement programme (REIPPPP) are obliged to make a real contribution to local economic development in the area. Awarded projects are required to spend a certain amount of their generated revenue on Socio-Economic Development (SED) and Enterprise Development (ED) and share ownership in the project company with local communities (DoE, 2011).

The developer is required to establish a community trust funded by revenue generated from the sale of energy. The community trust will generate a reliable and steady income stream over a 20 year period. The trust will be used to fund development initiatives in the area and support local economic and community development. As the community trust will run for the entire operation phase of 20 years, it allows the local municipality and communities to undertake long term planning. This provides opportunities for positive benefits to the local area.

However these benefits can be enhanced. Consultations took place with key local authorities from the NLM and the Ward Councillor for Ward 5. A few issues were raised from past experiences with the solar energy developments coming into the area. The key issues that the relevant authorities are facing include external workforces being brought into the area, social responsibilities not being met properly and a lack of communication with the relevant local authorities in terms of the community trust and socio-economic development plans. It is important for the developers to engage and communicate with the local municipality so that the municipality can provide guidance on what's required in the local area for socio-economic development plans. It is also important that the correct representatives are appointed to be part of the community trust. The solar energy development is supported by the local authorities and it was noted that the development has the potential to bring in more positive impacts to the local area however the issue raised need to be addressed with new developments coming into the area. Socio-economic spin-offs from the proposed PV facility could contribute to better infrastructure provision and educational investment in the local areas.

An in-depth community needs assessment (CNA) will need to be carried out at a later stage to make sure that the real needs of communities are addressed (in line with the local government) and the correct representatives of the community are appointed to run the community trust; in order to significantly contribute towards local economic growth, SED and ED.

Table 13: Assessment of the benefits associated with REIPPPP- SED and ED programmes and community trust

Operational Phase		
Nature: Benefits to the local area from SED/ ED programmes and community trust from REIPPPP social responsibilities		
	Without enhancement	**With enhancement**
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Highly probable (4)
Significance	**Medium (30)**	**Medium (48)**
Status (positive or negative)	Positive	Positive
Reversibility	Yes	
Irreplaceable loss of resources	No	
Can impacts be enhanced	No	
Enhancement » An in-depth community needs assessment (CNA) will need to be carried out to make sure that the real needs of communities are addressed (in line with the local government) and the correct representatives of the community are appointed to run the		

community trust. » Engagement and involvement of the local municipality (NLM) with social responsibility plans must be undertaken.
Residual impacts Improvements in local communities through socio-economic development and enterprise development.

The impact is assessed to be positive; local in extent; long term; moderate intensity; and highly probable. The impact is assessed to be of **medium positive significance** to the decision-making process.

5.2.4. Visual impact and sense of place impacts

The sense of place is developed over time as the community embraces the surrounding environment, becomes familiar with its physical properties, and creates its own history. The sense of place is created through the interaction of various characteristics of the environment, including atmosphere, visual resources, aesthetics, climate, lifestyle, culture and heritage. Importantly though it is a subjective matter and is dependent on community perceptions.

An impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light. The social impacts associated with the impact on sense of place relate to the change in the landscape character and visual impact from the proposed solar energy facility and associated infrastructure.

The impacted and majority of the adjacent landowners are farmers that utilise the land for livestock / game farming activities. There are homesteads located near the R34 and sparsely located on a few neighbouring farms. The proposed PV facility will only impact on a small number of homesteads, however there wer no concerns raised during the stakeholder consultation process. The proposed site is also located in a REDZ. The anticipated impact on the areas visual quality and sense of place is expected to be low.

Table 14: Visual impact and impacts on sense of place assessment

Operational Phase		
Nature: Visual impacts and sense of place impacts associated with the operation phase of the solar energy facility and associated infrastructure		
	Without mitigation	**With mitigation**
Extent	Local (2)	N/A
Duration	Long term (4)	N/A
Magnitude	Low (4)	N/A
Probability	Probable (3)	N/A
Significance	**Medium (30)**	N/A

Status (positive or negative)	Negative	N/A
Reversibility	Yes	
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	
Mitigation » Implement mitigation measures and recommendations proposed by the visual specialist as part of the VIA.		
Residual impacts None anticipated if the visual impact will be removed after decommissioning, provided the site is rehabilitated to its original (current) status.		

The impact is assessed to be negative; local in extent; long term; low intensity; and probable. The impact is assessed to be of **low significance** to the decision-making process, however review of the VIA should be acknowledged and recommendations implemented.

5.2.5. Impacts associated with the loss of agricultural land for livestock grazing

Direct occupation of land by the proposed solar energy facility has the effect of taking the impacted land out of agricultural production, through the occupation of the site by the footprint of the facility (less than 300ha for the 100MW PV facility). Currently the site and surrounding study area has limited potential for cultivation as a result of the nature of the soils and limited water availability, and is utilised for livestock and cattle grazing. The proposed PV facility is proposed to generate up to 100MW in capacity and will be constructed over an area of less than 300ha in extent within the broader property (~2 264ha). The activities associated with the operation phase will result in a loss of farmland available for grazing for the operation period of 20-25 years. However, the impacted landowner has noted that the grazing activities will still take place on the other portions of the farm that aren't occupied by the solar energy facility. Therefore the solar energy development will not interfere with livestock farming operations, and thereby the impact is assessed to be of low significance.

Table 15: Impact assessment of the loss of agricultural land for livestock grazing

Operation Phase		
Nature: Impacts associated with loss of farmland available for livestock grazing due to occupation of land by the solar energy facility		
	Without mitigation	**With mitigation**
Extent	Local (1)	N/A
Duration	Long-term (4)	N/A
Magnitude	Minor (2)	N/A
Probability	Highly probable (4)	N/A

Significance	**Low (28)**	N/A
Status (positive or negative)	Negative	N/A
Reversibility	Yes	
Irreplaceable loss of resources	At the development footprint for the duration of the operation phase of the solar energy facility	
Can impacts be mitigated	No	
Mitigation None anticipated		
Residual impacts Overall loss of farmland		

The impact is assessed to be negative; local in extent; long-term; low intensity; and probable. The impact is assessed to be of **low significance** to the decision-making process.

5.3. Cumulative Impacts

Possible cumulative impacts as a result of other similar projects and associated infrastructure in the area could have cumulative negative and positive impacts for the local community. Cumulative impacts have been considered as part of the social impact assessment and identified where relevant. The cumulative impacts of the project are related to the construction and operation phases. The site for the proposed PV facility is located within less than 12km from other renewable energy facilities. The impact of solar facilities on the landscape is considered to be a key issue in certain parts of South Africa where there is a growing number of solar energy facility applications.

It is also important to note that it is unlikely that all proposed renewable energy facilities located in the region will be built due to capacity constraints on the Eskom grid and the limits placed on renewable energy targets. The cumulative impacts for the proposed Woodhouse Solar 2 PV Facility has been assessed to be acceptable. Table 16 below lists the known solar projects in the area (also see Figure 11 below).

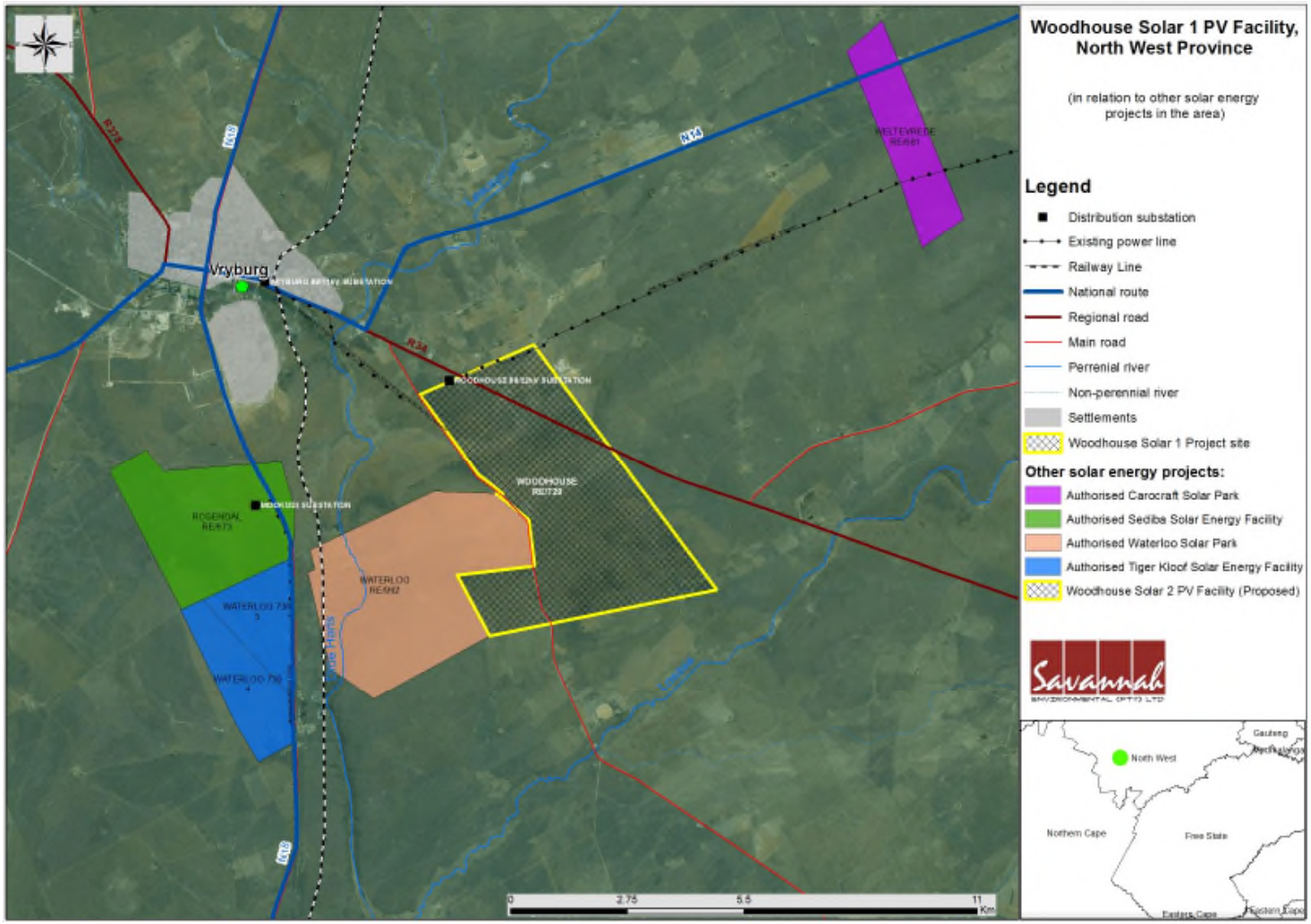

Figure 11: Location of the proposed Woodhouse Solar 2 PV Facility in relation to other solar energy facilities within a 10km radius from the site, in the North West Province.

Table 16: Other projects / developments within 10km from the proposed Woodhouse Solar 2 PV Facility site

Project Name	Location	Approximate distance from the site (measured from the centre)	Project Status
Proposed 60MW Carocraft PV Solar Park and associated infrastructure (a.k.a. the Carocraft Solar Park)	Remaining Extent and Portion 1 of Farm Weltevrede 681	~11.9km to the north east of the site	Authorised
Construction of the 75MW Photovoltaic facility and associated infrastructure in Naledi (a.k.a. the Sediba Solar Energy Facility)	Remaining Extent of the Farm Rosendal 673	~8.4km to the west of the site	Authorised
Proposed Tiger Kloof Solar Photovoltaic energy facility near Vryburg, North West Province (a.k.a. the Tiger Kloof Solar Energy Facility)	Portion 3 (RE) and Portion 4 of the Farm Waterloo 730	~8.2km to the west of the site	Authorised
The Proposed Construction Of The 75mw Photovoltaic Solar Plant And Associated Infrastructure On A Portion Of The Farm Waterloo 992 In, Naledi Local Municipality Of The North West Province (a.k.a. the Waterloo Solar Park)	Remaining Extent of Farm Waterloo 992	~4.2km to the west of the site	Authorised: Preferred Bidder Round 4.5
Proposed Woodhouse Solar 2 PV Facility in the North West Province.	Remaining Extent of the Farm Woodhouse 729	~3.3 km to the south of the Woodhouse Solar 2 PV Facility development	In process

It is clear from the above that there is a concentration of solar facilities in the broader area around Vryburg. This is considered to be in line with Provincial and National Planning for solar energy development (in terms of the REDZ). The Woodhouse Solar 2 PV Facility falls within the identified geographical area most suitable for the rollout of the development of solar energy projects within the REDZ. This implies that projects of the same nature will be consolidated in one area creating a node, and ultimately aiming to reduce the potential for cumulative impacts associated with such developments when spatially fragmented. The potential for significant cumulative

impacts is however likely to be high. This could result in positive permanent impacts on the economy, business development, employment and education in the area and the Province. It may also result in some negative impacts such as an influx of jobseekers and change to the landscape and areas sense of place. However the cumulative impacts for the proposed Woodhouse Solar 2 PV Facility have been assessed to be acceptable (as detailed below).

5.3.1. Cumulative impacts from employment, skills and business opportunities

The proposed PV facility and the establishment of other solar energy facilities has the potential to result in significant positive cumulative impacts; specifically with the creation of a number of socio-economic opportunities for the Province, which in turn, will result in a positive social benefit. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. Benefits to the local, regional and national economy through employment and procurement of services could be substantial should many renewable energy facilities proceed. This benefit will increase significantly should critical mass be reached that allows local companies to develop the necessary skills to support construction and maintenance activities and that allows for components of the renewable energy facilities to be manufactured in South Africa. Furthermore at municipal level, the cumulative impact could be positive and could incentivize operation and maintenance companies to centralise and expand their activities towards education and training more closely to the projects. Cumulative impacts on local entrepreneurs will be positive and assist in developing their businesses further. Also renewable energy projects under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) are obliged to make a real contribution to local economic development in the area. Awarded projects are required to spend a certain amount of their generated revenue on Socio-Economic Development (SED) and Enterprise Development (ED) and share ownership in the project company with local communities. The cumulative impacts are likely to have significant positive impact on the local economy.

Table 17: Cumulative impacts of employment opportunities, business opportunities and skills development

Nature: An increase in employment opportunities, skills development, SED and business opportunities with the establishment of more than one solar energy facility		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local- Regional (3)	Local- regional (3)

Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	**Low (27)**	**Medium (39)**
Status (positive or negative)	Positive	Positive
Reversibility	N/A	
Irreplaceable loss of resources	N/A	
Can impacts be enhanced	Yes	
Confidence in findings	High	
Enhancement The establishment of a number of solar energy facilities in the area has the potential to have a positive cumulative impact on the area in the form of employment opportunities, skills development, business opportunities and SED/ED. The positive benefits will be enhanced if local employment policies are adopted and local services providers are utilised by the developers to maximise the project opportunities available to the local community.		

The impact is assessed to be positive; local to regional in extent; long-term; moderate intensity and probable. The overall impact is likely to have a **medium positive significance** to the local area.

5.3.2. Cumulative impacts with large scale in-migration of people

The development of large-scale solar projects in the local area will likely draw a large number of labour, businesses and jobseekers to the area. If the local labour force cannot be sourced locally or the local labour pool is inadequate for the solar energy project, outside labour will likely move to the area to fill the gap. The area may experience an influx of new residents who may move to the area looking for job opportunities; which will have effects on the existing population during the construction periods that could entail problems of housing, sanitation, water usage and solid waste disposal. Employment for a solar energy facility peaks during construction and significantly declines during operation; since solar energy facilities need relatively few workers while in operation, solar facilities will not create long-term boomtowns. Though there may be an influx of workers during construction, these workers are largely temporary. Rapid population growth is a common experience in rural towns near new large development projects. Towns with larger populations (greater than 1 000 individuals) and with developed services will likely experience greater rates of population growth than areas without developed services. In relation to the area, the towns that are sensitive receptors will be Vryburg (population of 21 182 people) and the smaller settlements nearby. With the influx of new individuals, secondary industries in the town may also begin to grow, more individuals will move to the area to fill these secondary positions. The impact of this on services and resources is likely to impact the current communities and increase the pressure on local municipalities to meet the basic needs of these potential new communities. The

poor communities are likely to be the most vulnerable to loss of service provision and suffer the negative impact of large scale in-migration. There is potential for the influx of migrants to significantly change the local receiving environment and this is likely to have a permanent impact in the region. If more than one solar energy facility is under construction at any one time, then the impacts from in-migration of people is likely to have more of a negative impact on the local area. It is very difficult to control an influx of people into an area, especially in a country where unemployment rates are high.

Table 18: Cumulative impacts with large-scale in-migration of people

Construction & Operational Phase		
Nature: Negative impacts and change to the local economy with an in-migration of labourers, businesses and jobseekers to the area.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (3)	Local (3)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Moderate (6)
Probability	improbable (2)	Probable (3)
Significance	**Low (18)**	**Medium (39)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources	No	
Can impacts be mitigated	Yes	
Confidence in findings	Medium	
Mitigation » Develop a recruitment policy/ process (to be implemented by contractors), which will source labour locally, where feasible. » Working together with government agencies to ensure service provision is in line with the development needs of the local area. » Forming joint ventures with community organisations, through Trusts, which can provide local communities with benefits, such as employment opportunities and services.		

The impact is assessed to be negative; local to regional in extent; long-term; moderate intensity and probable. The overall impact is likely to have a **medium negative significance** to the local area.

5.3.3. Cumulative impacts on the sense of place and landscape

The visual impact of solar energy facilities (PV and CSP) is likely to change the immediate landscape of the area. The cumulative impact of other solar energy

projects in the area could alter the nature of the visual landscape. The potential impact of solar facilities on the landscape is an issue that does need to be taken into consideration, specifically given the growing number of solar energy facility applications in the North West Province. The proposed site is however located with the REZ, these zones have been put forward in order to focus development and inform planning. There are a number of proposed solar energy facilities in the nearby area, which will have a significant impact on the areas sense of place. With regards to the area, more solar energy facilities could be proposed in the future. The Environmental Authorities in the Province should therefore be aware of the potential cumulative impacts when evaluating applications.

Table 19: Cumulative visual impacts and impacts on sense of place assessment

Operational Phase		
Nature: Visual impacts and change in the sense of place impacts associated with the establishment of more than one solar energy facility in the area		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (2)	Local (2)
Duration	Long term (4)	Long term (4)
Magnitude	Minor (2)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	**Low (24)**	**Medium (36)**
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources	No	
Can impacts be mitigated	No	
Mitigation » Implement mitigation measures and recommendations proposed by the visual specialist as part of the VIA.		

The impact is assessed to be negative; local to regional in extent; long-term; moderate intensity and probable. The overall impact is likely to have a **medium negative significance** to the local area.

5.4. Decommissioning Phase

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed PV facility the decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in 20 - 25 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the job losses typically associated with decommissioning however for a limited period of time.

Given the relatively small number of people employed during the operation phase (~60), the social impacts at a community level associated with decommissioning are likely to be limited. In addition, potential impacts associated with the decommissioning phase can be effectively managed with the implementation of a retrenchment and downscaling programme.

Table 20: Social impacts associated with decommissioning

Nature: Social impacts associated with retrenchment including loss of jobs and source of income		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Short term (1)	Short Term (1)
Magnitude	Moderate (6)	Low (4)
Probability	Highly Probable (4)	Highly Probable (4)
Significance	**Medium (36)**	**Low (28)**
Status	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources?	No	
Can impact be mitigated?	Yes	
Mitigation » Implementation of a retrenchment and downscaling programme » All structures and infrastructure associated with the proposed PV facility should be dismantled, removed and transported off-site on decommissioning; & the landscape rehabilitated/ re-vegetated.		
Residual impacts Loss of jobs and associated loss of income, can impact on local economy and other businesses.		

The impact is assessed to be negative; local in extent; short term; low intensity; and highly probable. The impact is assessed to be of **low significance** to the decision-making process.

5.5. Comparative Analysis of Alternatives

The selection of the study area (Farm Woodhouse RE/729) was based on a detailed pre-feasibility study, which considered climatic conditions in the area, extent of the site, topographic conditions, availability of land, road access and proximity to a grid connection. No site (study area- farm Woodhouse RE/729) alternatives are proposed for this project. A summary of the comparative analysis of alternatives that were assessed are as follows:

» Regarding the two site layout options being considered that are located within the identified study area, it can be concluded that:
  - From a social perspective there is not a big difference regarding which site layout is chosen. The layout options are located a significant distance away from the R34 and would both need to be accessed from the secondary gravel road off the R34 called the Amalia road.
  - Either of the site layout options can be chosen from a social perspective, subject to the implementation of the recommended mitigation measures and management actions contained in the report.

Aspect	**Preferred development footprint (site layout in the south west corner of Farm Woodhouse RE/729)**	**Alternative development footprint (site layout in the centre of Farm Woodhouse RE/729)**
Social	Acceptable – **Preferred Alternative** * Job creation * Contribute to the development of clean, renewable energy infrastructure * Create temporary Nuisance Impacts (noise and dust) * Visual impact and sense of place impacts	Acceptable - * Job creation * Contribute to the development of clean, renewable energy infrastructure * Create temporary Nuisance Impacts (noise and dust) * Visual impact and sense of place impacts

» With regards to the four alternative grid connection options being considered, the socially preferred grid connection option is the Alternative 4; as this option is located the closest to the grid connection which would result in the shortest length of a power line.

Aspect	**Grid connection Alternative 1**	**Grid connection Alternative 2**	**Grid connection Alternative 3**	**Grid connection Alternative 4**

Social	Acceptable– » Length of power line is 160m » Development to take place on Woodhouse RE/729.	Least preferred– » Longest power line route (747m) » Development to take place on Woodhouse RE/729. » Located parallel to an existing Eskom power line.	Acceptable– » Length of power line is 146m » Development to take place on Woodhouse RE/729.	Acceptable – **Preferred Alternative** » Shortest power line route (80m) » Development to take place on Woodhouse RE/729.

5.6. Assessment of Impacts for the No-go Option:

The impacts of pursuing the No-go Option are both positive and negative as follows:

» The benefits would be that there is no disruption from, nuisance impacts (noise and dust during construction) and safety and security impacts. The impact is therefore neutral.
» There would be an opportunity loss in terms of job creation, skills development and associated economic business opportunities for the local economy.

Foregoing the proposed solar energy development would not necessarily compromise the development of renewable energy facilities in South Africa. However, the socio-economic benefits for local communities would be forfeited.

5.7. Conclusion and Recommendations

The SIA has primarily focused on the collection of primary data to identify and assess social issues and potential social impacts. Secondary data was collected and presented in a literature review and primary data was collected through consultations with key stakeholder and the public participation process. The environmental assessment framework for the assessment of impacts and the relevant criteria were applied to evaluate the significance of the potential impacts. A summary of the potential positive and negative impacts identified in the SIA for the construction and operation phase are presented in Tables 21 and 22 below and a summary of the cumulative social impacts is also provided in Table 23.

Table 21: Summary of social impacts during construction phase

CONSTRUCTION PHASE

Impact	Significance without Mitigation/ enhancement	Significance with Mitigation/ enhancement
Positive Impacts		
Direct employment and skills development	Medium (36)	Medium (44)
Economic multiplier effects	Medium (30)	Medium (36)
Negative Impacts		
Influx of jobseekers	Low (24)	Low (18)
Impacts on daily living and movement patterns (Traffic Impacts)	Medium (30)	Low (16)
Safety and security risks	Low (27)	Low (14)
Nuisance impact (noise and dust)	Low (15)	Low (12)

Table 22: Summary of social impacts during operation phase

OPERATION PHASE		
Impact	**Significance without Mitigation/ enhancement**	**Significance with Mitigation/ enhancement**
Positive Impacts		
Direct employment and skills development	Medium (40)	Medium (48)
Development of clean, renewable energy infrastructure	Medium (40)	Medium (40)
Benefits associated with REIPPP socio-economic development plans and community trust	Medium (30)	Medium (48)
Negative Impacts		
Visual and sense of place impacts	Medium (30)	Low (24)
Impacts associated with the loss of agricultural land	Low (28)	Low (28)

Table 23: Summary of cumulative social impacts

CUMULATIVE IMPACTS

Cumulative Impact	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Positive Cumulative Impacts		
Cumulative impacts from employment, skills and business opportunities	Low (27)	Medium (39)
Negative Cumulative Impacts		
Cumulative impacts with large-scale in-migration of people	Low (18)	Medium (39)
Cumulative impacts on the sense of place and landscape	Low (24)	Medium (36)

Key findings

From a social perspective it is concluded that the project is supported, but that mitigation measures should be implemented and adhered to. Positive and negative social impacts have been identified. The assessment of the key issues indicated that there are no negative impacts that can be classified as fatal flaws and which are of such significance that they cannot be successfully mitigated. Positive impacts could be enhanced by implementing appropriate enhancement measures and through careful planning. Based on the social assessment, the following general conclusions and findings have been made:

» The potential negative social impacts associated with the construction phase are typical of construction related projects and not just focussed on the construction of the proposed PV facility (these relate to influx of non-local workforce and jobseekers, intrusion and disturbance impacts, safety and security) and could be reduced with the implementation of the mitigation measures proposed.
» Employment opportunities will be created in the construction and operation phase and the impact is rated as positive even if only a small number of individuals benefit in this regard.
» The proposed project could assist the local economy in creating entrepreneurial development, especially if local business could be involved in the provision of general material and services during the construction and operational phases.
» Capacity building and skills training among employees are critical and would be highly beneficial to those involved, especially if they receive portable skills to enable them to also find work elsewhere and in other sectors.
» The proposed PV facility also represents an investment in infrastructure for the generation of clean, renewable energy, which, given the increased awareness of climate change, represents a positive social benefit for society as a whole.

Recommendations

The following recommendations are made on the basis of the SIA and a thorough review of the concerns and suggestions raised by stakeholders and interested and affected parties during the stakeholder engagement process. The proposed mitigation measures should be implemented to limit the negative impacts and enhance the positive impacts. Based on the social assessment, the following recommendations are made:

» The EPC contractor should appoint a designated staff member to assist with the management of social impacts and to deal with any community issues.
» In terms of employment related impacts, it is important to consider that job opportunities for the unskilled and semi-skilled in the study area could create competition among the local unemployed. Introducing an outside workforce will therefore most likely worsen local endeavours to obtain jobs and provoke discontent as well as put pressure on the local services available. It is imperative that local labour be sourced, wherever possible, to ensure that benefits accrue to the local communities. Efforts should be made to involve local businesses during the construction activities where possible. Local procurement of labour and services/products would greatly benefit the community during the construction and operational phases of the project.
» Local procurement of services and equipment where possible in order to enhance the multiplier effect. This would serve to mitigate other subsequent negative impacts such as those associated with the inflow of outsiders to the area, the increased pressure on the infrastructure and services in the area, as well as the safety and security concerns.
» Involve the community in the process as far as possible (encourage co-operative decision making and partnerships with local entrepreneurs).
» Implement mitigation measures to reduce and avoid negative impacts.
» Employ mitigation measures to minimise the dust pollution and damage to existing roads and fences / gates.
» Safety and security risks should be taken into account during the planning/ construction phase of the proposed project. Access control, security and management should be implemented to limit the risk of crime increasing in the area.

Overall Conclusion

The proposed PV facility and associated infrastructure is unlikely to result in permanent damaging social impacts. From a social perspective it is concluded that

the project could be developed subject to the implementation of the recommended mitigation measures and management actions contained in the SIA report.

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APPENDIX A: SIA ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)-

Construction Phase

Direct employment and skills development

OBJECTIVE: Maximise local employment and skills opportunities associated with the construction phase	
Project component/s	Construction of the proposed project and associated infrastructure
Potential Impact	The opportunities and benefits associated with the creation of local employment and skills development to be maximised.
Activity/risk source	» Construction procurement practice employed by the EPC contractor » Developers investment plan
Enhancement: Target/Objective	The developer should aim to employ as many low-skilled and semi-skilled workers from the local area as possible. This should also be made a requirement for all contractors.

Enhancement: Action/control	**Responsibility**	**Timeframe**
If possible, employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria	The Developer & EPC Contractor	Pre-construction & construction phase
It is recommended that a local employment policy is adopted to maximise the opportunities made available to the local labour force (sourced from nearest towns/settlements)	The Developer & EPC Contractor	Pre-construction & construction phase
The recruitment selection process should seek to promote gender equality and the employment of women wherever possible	EPC Contractor	Pre-construction & construction phase
Where feasible, training and skills development programmes are to be initiated prior to the commencement of the construction phase	The Developer	Pre-construction & construction phase
A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained, by the Contractor to record all complaints and queries relating to the project and the action taken to resolve the issue.	EPC Contractor	Pre-construction & construction phase

Performance Indicator	» Employment policy document that sets out local employment and targets completed before construction phase commences; » Employ as many local semi and unskilled labour as possible. » Training and skills development programme undertaken prior to the commencement of construction phase.
Monitoring	» The developer and EPC contractor must keep a record of local recruitments and information on local labour to be shared with the ECO for reporting purposes.

Economic multiplier effects

OBJECTIVE: Maximise the local economic multiplier effect during construction phase

Project component/s	Construction of the proposed solar energy facility and associated infrastructure
Potential Impact	Potential local economic benefits
Activity/risk source	Developers procurement plan
Enhancement: Target/Objective	Increase the procurement of goods and services especially within the local economy

Enhancement: Action/control	**Responsibility**	**Timeframe**
It is recommended that a local procurement policy is to be adopted to maximise the benefits to the local economy	The Developer & EPC Contractor	Pre-construction & construction phase
Where feasible, develop a database of local companies, specifically Historically Disadvantaged (HD) which qualify as potential service providers (e.g. construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) prior to the tender process and invite them to bid for project-related work where applicable	The Developer& EPC Contractor	Pre-construction & construction phase
Where feasible, source as much goods and services as possible from the local area. Engage with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers	The Developer	Pre-construction & construction phase

Performance Indicator	» Local procurement policy is adopted » Local goods and services are purchased from local suppliers where feasible
Monitoring	» The developer must monitor indicators listed above to ensure that they have been met for the construction phase

Impacts from an influx of jobseekers

OBJECTIVE: Reduce the pressure on economic and social infrastructure and social conflicts from an influx of jobseekers during the construction phase

Project component/s	Construction of the proposed solar energy facility and associated infrastructure
Potential Impact	Decline on local economic and social infrastructure and services as well as a rise in social conflicts from an influx of jobseekers
Activity/risk source	Influx of jobseekers
Mitigation: Target/Objective	To avoid or minimise the potential impact on local infrastructure, services and communities and their livelihoods

Mitigation: Action/control	**Responsibility**	**Timeframe**
A 'locals first' policy should be advertised for construction employment opportunities, especially for semi and low-skilled job categories.	The Developer & EPC contractor	Pre-construction & construction phase
Tender document should stipulate the use of local labour as far as possible	EPC contractor	Pre-construction & construction phase
Prior to construction commencing representatives from the local community (e.g. ward councillor, surrounding landowners) should be informed of details of the construction schedule and exact size of the workforce.	The Developer & EPC contractor	Pre-construction & construction phase
Recruitment of temporary workers at the gates of the development should not be allowed. A recruitment office should be established by the contractor in a nearby town to deal with jobseekers.	EPC contractor	Pre-construction & construction phase
Have clear rules and regulations for access to the proposed site.	EPC contractor	Pre-construction & construction phase
Local community organisations and policing forums / neighbourhood watches must be informed of construction times and the duration of the construction phase. Also establish procedures for the	The Developer & EPC contractor	Pre-construction phase & Construction phase

Mitigation: Action/control	Responsibility	Timeframe
control and removal of loiters at the construction site		
Security company to be appointed and appropriate security procedures to be implemented	The Developer & EPC contractor	Pre-construction phase & Construction phase

Performance Indicator	» Ensure 'locals first' policy is adopted/advertised » Ensure no recruitment takes place on site » Control/removal of loiters
Monitoring	» The developer must keep a record of local recruitments and information on local labour to be shared with the ECO for reporting purposes

Impacts on daily living and movement patterns

OBJECTIVE: To avoid or reduce impacts on farm infrastructure (fences, gates and roads) and to avoid traffic disruptions and movement patterns of local community during the construction phase

Project component/s	Construction of the proposed solar energy facility and associated infrastructure
Potential Impact	Increase in traffic disruptions, safety hazards, and impacts on farm infrastructure and impacts movement patterns of local community
Activity/risk source	Construction activities affecting farm infrastructure and daily living and movement patterns
Mitigation: Target/Objective	To avoid or minimise the potential impact on local communities and their livelihoods and / or properties

Mitigation: Action/control	Responsibility	Timeframe
All vehicles must be road worthy and drivers must be qualified, obey traffic rules, follow speed limits and made aware of the potential road safety issues.	EPC contractor	Pre-construction phase & Construction phase
Heavy vehicles should be inspected regularly to ensure their road safety worthiness.	EPC contractor	Construction phase
Implement penalties for reckless driving for the drivers of heavy vehicles as a way to enforce compliance to traffic rules.	EPC contractor	Construction phase
A comprehensive employee induction programme to cover land access protocols and road safety.	The Developer & EPC contractor	Pre-construction phase & Construction phase
A method of communication should be implemented	EPC Contractors	Pre-construction &

Mitigation: Action/control	Responsibility	Timeframe
whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained, by the Contractor and monitored by the ECO, to record all complaints and queries relating to the project and the action taken to resolve the issue.		construction phase

Performance Indicator	» Vehicles are roadworthy, inspected regularly and speed limits are adhered to » Roads and electric fencing are maintained or improved upon if disturbed from project activities
Monitoring	» The developer and EPC contractor must monitor the indicators listed above to ensure that they have been met for the construction phase

Safety and security impacts

OBJECTIVE: To avoid or reduce the possibility of the increase in crime and safety and security issues during the construction phase

Project component/s	Construction of the proposed solar energy facility and associated infrastructure
Potential Impact	Increase in crime due to influx of non-local workforce and job seekers into the area
Activity/risk source	Safety and security risks associated with construction activities
Mitigation: Target/Objective	To avoid or minimise the potential impact on local communities and their livelihoods

Mitigation: Action/control	Responsibility	Timeframe
Working hours should be kept to daylight hours during the construction phase, and/or as any deviation that is approved by the surrounding landowners.	EPC contractor	Construction phase
The perimeter of the construction site should be appropriately secured to prevent any unauthorised access to the site; the fencing of the site should be maintained throughout the construction periods.	EPC contractor	Pre-construction phase & Construction phase
A security company is to be appointed and appropriate security procedures are to be implemented.	EPC contractor	Construction Phase
Access in and out of the site should be strictly controlled by a security company.	EPC contractor	Construction Phase

Mitigation: Action/control	Responsibility	Timeframe
Provide workers with identity tags and prohibit the access of unauthorized people to the construction site.	Provide workers with identity tags and prohibit the access of unauthorized people to the construction site.	Provide workers with identity tags and prohibit the access of unauthorized people to the construction site.
The developer and engineering, procurement and construction (EPC) contractors must ensure that there is a dedicated access and an access control point at the entrance gate on Farm Woodhouse RE/729.	EPC contractor	Construction phase
Infrastructure such as fencing and/or gates along access route must be maintained in the present condition or repaired if disturbed due to project activities	The Developer & EPC contractor	Construction phase
Open fires on the site for heating, smoking or cooking are not allowed, except in designated areas.	EPC contractor	Construction phase
Provide adequate firefighting equipment on site and provide firefighting training to selected construction staff.	EPC contractor	Pre-construction phase & Construction phase
A comprehensive employee induction programme to be developed and utilised to cover land access protocols, fire management and road safety	EPC contractor	Pre-construction phase & Construction phase
Ensure roads utilised are either maintained in the present condition or restored if disturbed from project activities	The Developer & EPC contractor	Construction phase
Provision of adequate and strategically placed traffic warning signs and control measures along the access road and R34 to warn road users of the construction activities taking place and displaying road safety messages and speed limits. Warning signs must be visible at all times.	EPC contractor	Construction phase
Have a personal trained in first aid on site to deal with smaller incidents that require medical attention	EPC Contractor	Pre-construction phase & construction phase
All vehicles must be road worthy and drivers must be qualified and made aware of the potential road safety issues and follow the speed limits.	EPC Contractor	Pre-construction phase & construction phase
A method of communication should be implemented	EPC Contractor	Pre-construction &

Mitigation: Action/control	Responsibility	Timeframe
whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained, by the Contractor and monitored by the ECO, to record all complaints and queries relating to the project and the action taken to resolve the issue.		construction phase

Performance Indicator	» Employee induction programme, covering land access protocols, fire management and road safety » The construction site is appropriately secured with a controlled access system » Ensure a security company is appointed and appropriate security procedures and measures are implemented
Monitoring	» The developer and EPC contractor must monitor the indicators listed above to ensure that they have been met for the construction phase

Nuisance impacts (Noise and dust)

OBJECTIVE: To avoid or minimise the potential impacts of noise and dust from construction activities during the construction phase

Project component/s	Construction of the proposed solar energy facility and associated infrastructure
Potential Impact	Heavy vehicles and construction activities can generate noise and dust impacts.
Activity/risk source	Construction activities
Mitigation: Target/Objective	To avoid and or minimise the potential noise and dust impacts associated with construction activities

Mitigation: Action/control	Responsibility	Timeframe
Implement appropriate dust suppression measures on a regular basis along the gravel access road and on the proposed site.	EPC Contractor	Construction phase
Vehicles used to transport sand and building materials must be fitted with tarpaulins or covers when travelling on roads.	EPC Contractor	Construction phase
Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues	EPC Contractor	Construction phase

Mitigation: Action/control	Responsibility	Timeframe
A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. The EPC contractor should appoint a designated staff member to implement grievance procedures and address issues and complaints. A Public Complaints register must be maintained by the Contractor and monitored by the ECO to record all complaints and queries relating to the project and the action taken to resolve the issue.	EPC Contractor	Pre-construction & construction phase

Performance Indicator	» Dust suppression measures implemented for all heavy vehicles and construction vehicles that require such measures during the construction phase » Grievance mechanism and communication channel procedures
Monitoring	» The EPC contractor must monitor the indicators to ensure that they have been met for the construction phase

Operation Phase:

Direct employment and skills development during operation phase

OBJECTIVE: Maximise local employment and skills opportunities associated with the operation phase

Project component/s	Operation and maintenance of the proposed solar energy facility and associated infrastructure
Potential Impact	Loss of opportunities to stimulate production and employment of the local economy
Activity/risk source	Labour practices employed during operations
Mitigation: Target/Objective	Maximise local community employment benefits in the local economy

Mitigation: Action/control	Responsibility	Timeframe
It is recommended that local employment policy is adopted to maximise the opportunities made available to the local community.	The Developer & EPC contractor	Operation phase
The recruitment selection process should seek to promote gender equality and the employment of women wherever possible	The Developer & EPC contractor	Operation phase
Establish vocational training programs for the local labour force to promote the development of skills	The Developer	Operation phase

Performance Indicator	» Percentage of workers that were employed from local communities » Number of people attending vocational training on an annual basis
Monitoring	» The developer must keep a record of local recruitments and information on local labour to be shared with the ECO for reporting purposes

Benefits associated with REIPPP socio-economic development plans and community trust

OBJECTIVE: Maximise benefits for local communities associated with socio-economic development plans and community trust

Project component/s	Operation and maintenance of the proposed solar energy facility and associated infrastructure
Potential Impact	Loss of socio-economic opportunities for local area
Activity/risk source	Operation of the PV facility and associated infrastructure
Mitigation: Target/Objective	Maximise local community benefits in the local economy

Mitigation: Action/control	Responsibility	Timeframe
An in-depth community needs assessment (CNA) will need to be carried out to make sure that the real needs of communities are addressed (in line with the local government) and the correct representatives of the community are appointed to run the community trust	The Developer	Pre-Operation phase
Engagement and involvement of the local municipality with regards to social responsibility plans	The Developer	Pre-Operation phase

Performance Indicator	» Community needs assessment » Engage and involvement of the local municipality
Monitoring	» The developer must keep a record of key stakeholders consultations that took place with the local municipality and key community members

APPENDIX B: MINUTES OF MEETINGS DURING SIA STAKEHOLDER CONSULTATION PROCESS

Below are the minutes of the meetings that were undertaken during the social stakeholder consultation process. The minutes of the meetings that were undertaken during the Public Participation (PP) Process were also taken into consideration in the SIA. See minutes of the PP meetings and the Comments and Response Report as part of the EIA report.

Note: There is an additional 100MW PV facility (called Woodhouse Solar 2 PV facility) that is planned to form part of the Woodhouse developments on Farm Woodhouse RE/729. During the SIA stakeholder meetings both the commercial PV solar energy facilities (known as Woodhouse Solar 1 and Woodhouse Solar 2 PV facilities) were discussed in the meetings.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

WOODHOUSE SOLAR 1 AND 2 PV FACILITIES, NORTH WEST PROVINCE

Savannah Environmental (Pty) Ltd
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SOCIAL IMPACT ASSESSMENT (SIA) PROCESS

NOTES OF THE MEETING IMPACTED & ADJACENT LANDOWNER - D. WEBBER (WOODHOUSE RE/729)

HELD ON
WEDNESDAY 16 MARCH 2016 AT 12:30

VENUE
FARM WOODHOUSE RE/729

Notes for the Record prepared by:
Savannah Environmental
Please address any comments to Gabriele Wood at the above address.

MEETING:

WOODHOUSE PV 1 AND 2 SOLAR ENERGY FACILITIES, NORTH WEST PROVINCE

Venue: Farm Woodhouse RE/729
Date: Wednesday 16 March 2016
Time: 12:30

WELCOME AND INTRODUCTION

Candice Hunter of Savannah Environmental welcomed Mr Webber and introduced herself as the Social Consultant from Savannah Environmental. She noted that Genesis Woodhouse Solar 1 (Pty) Ltd and Woodhouse Solar 2 (Pty) Ltd proposes the development of commercial photovoltaic (PV) solar energy facilities, known as the Woodhouse Solar 1 PV Facility and Woodhouse Solar 2 PV Facility, as well as associated infrastructure on the Remaining Extent of the farm Woodhouse 729 which is located approximately 10km south east of Vryburg in the North West Province. She explained that Savannah Environmental has been appointed as the independent environmental consultancy to undertake the Environmental Impact Assessment (EIA) for the project.

Candice Hunter thanked Mr Webber for the opportunity to brief him about the proposed project. She noted that the purpose of the meeting was to present the background of the project, provide an overview of the environmental assessment process and discuss any potential social issues and concerns with the proposed developments.

MEETING ATTENDEES

Name	Organisation & Position
H.S.D. Webber (DW)	Impacted and adjacent landowner: • Woodhouse RE/729 • Lockerbie RE/7/727 • Lockerbie RE/727
Candice Hunter (CH)	Savannah Environmental –Social Consultant

APOLOGIES

None

BACKGROUND & TECHNICAL ASPECTS REGARDING THE PROPOSED PROJECT

Candice Hunter discussed the background and introduction to the project and the Environmental Impact Assessment process. A Background Information Document (BID) and a map including the location of the proposed developments were presented.

DISCUSSION SESSION

Question / Comment	Response
CH: What do you currently use your farms for?	DW: Livestock farming (cattle). We used to have crops but not anymore.
CH: Does anyone reside on any of your farms (farm owners, farm tenants, farm workers): • Woodhouse RE/729 • Lockerbie RE/7/727 • Lockerbie RE/727	DW: We live on Farm Woodhouse RE/729, approximately 1km north west of the Eskom substation (on the northern side of the R34). Nobody else resides on the farms. There are vacant buildings located on the southern section of Farm Woodhouse RE/729. When people lived there, theft of cattle became a problem. Currently, nobody lives there now.
CH: Do you know who owns Farm Lockerbie 9/727? What is the current land use of that farm? Do you have any contact details of the land owner?	DW: I haven't seen anyone on that farm in a while. I think the owner of the farm now lives in Namibia (contact details were provided). I know cattle grazing activities used to take place on the farm, but the land was too small for grazing. I've seen a bull and two cows around but that is all.
DW: There is a lot of theft in the area, as well as hunting. So I've fenced off most of the area, but everything just keeps getting stolen.	
CH: Do you have any game on your farm?	DW: There are bush pigs on the farm, as well as steenbok and duikers. But all of these are communal game. We don't farm game but one of the neighbouring farms breed and farm lions.

Question / Comment	Response
CH: What will happen to the livestock farming in the areas where the developments are going to takes place?	DW: The farming activities will continue around the development areas. I can manage without the land. I'm considering to stop farming in the near future as theft is a major problem in the area.
CH: Do you have any other concerns with the proposed development in terms of noise, dust, traffic impacts, visual impacts and safety and security concerns?	DW: I don't have any concerns, we are hoping that these developments take place. Crime is a big problem in the area.

WAY FORWARD AND CLOSURE

In closing Candice noted that the EIA Report will be made available for public review in the next few weeks and that Interested and Affected Parties could submit their written comments on the EIA process and proposed project to Savannah Environmental. She noted that the comments received would be included in the EIA Report that will be submitted to the Department of Environmental Affairs. She thanked Mr Webber for the inputs which were provided. The meeting was closed at 13:30.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

WOODHOUSE SOLAR 1 AND 2 PV FACILITIES, NORTH WEST PROVINCE

Savannah Environmental (Pty) Ltd
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SOCIAL IMPACT ASSESSMENT (SIA) PROCESS

NOTES OF THE MEETING ADJACENT LANDOWNER - FARM CHAMPIONS KLOOF RE/4/731

HELD ON WEDNESDAY 16 MARCH 2016 AT 13:30

VENUE VRYBURG

Notes for the Record prepared by:
Savannah Environmental
Please address any comments to Gabriele Wood at the above address.

MEETING:

WOODHOUSE PV 1 AND 2 SOLAR ENERGY FACILITIES, NORTH WEST PROVINCE

Venue: Vryburg
Date: Wednesday 16 March 2016
Time: 13:30

WELCOME AND INTRODUCTION

Candice Hunter of Savannah Environmental welcomed Mr Meyer and introduced herself as the Social Consultant from Savannah Environmental. She noted that Genesis Woodhouse Solar 1 (Pty) Ltd and Woodhouse Solar 2 (Pty) Ltd proposes the development of commercial photovoltaic (PV) solar energy facilities, known as the Woodhouse Solar 1 PV Facility and Woodhouse Solar 2 PV Facility, as well as associated infrastructure on the Remaining Extent of the farm Woodhouse 729 which is located approximately 10km south east of Vryburg in the North West Province. She explained that Savannah Environmental has been appointed as the independent environmental consultancy to undertake the Environmental Impact Assessment (EIA) for the project.

Candice Hunter thanked Mr Meyer for the opportunity to brief him about the proposed project. She noted that the purpose of the meeting was to present the background of the project, provide an overview of the environmental assessment process and discuss any potential social issues and concerns with the proposed developments.

MEETING ATTENDEES

Name	Organisation & Position
Bertus Meyer (BM)	Adjacent Landowner- Farm Champions Kloof RE/4/731
Candice Hunter (CH)	Savannah Environmental –Social Consultant

APOLOGIES

None

BACKGROUND & TECHNICAL ASPECTS REGARDING THE PROPOSED PROJECT

Candice Hunter discussed the background and introduction to the project and the Environmental Impact Assessment process. A Background Information Document (BID) and a map including the location of the proposed developments were presented.

DISCUSSION SESSION

Question / Comment	Response
BM: When did Genesis (Pty) Ltd and David Webber start with this project?	CH: The EIA process commenced last year, and we are hoping to receive environmental authorisation by August so that the project can bid in the next bidding round.
CH: What do you currently use your farm for?	BM: Cattle and game farming activities (lions). I breed and sell lions.
CH: Does any live on the farm Champions Kloof Re/4/731?	BM: Only a few of my farm workers.
CH: Do you have any issues or concerns with the proposed developments?	BM: No, I do not have any issues or concerns.
CH: Will the proposed developments impact your farming activities in any way in terms of noise, dust, traffic impacts, visual impacts and safety and security concerns?	BM: No, I have no concerns with the developments.

WAY FORWARD AND CLOSURE

In closing Candice noted that the EIA Report will be made available for public review in the next few weeks and that Interested and Affected Parties could submit their written comments on the EIA process and proposed project to Savannah Environmental. She noted that the comments received would be included in the EIA Report that will be submitted to the Department of Environmental Affairs. She thanked Mr Meyer for the inputs which were provided. The meeting was closed at 14:00.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

WOODHOUSE SOLAR 1 AND 2 PV FACILITIES, NORTH WEST PROVINCE

Savannah Environmental (Pty) Ltd
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SOCIAL IMPACT ASSESSMENT (SIA) PROCESS

NOTES OF THE MEETING ADJACENT LANDOWNER – FARM BRANDWAGT 14/728, BRANDWAGT RE/2/728 AND LOCKERBIE RE/1/27

HELD ON
WEDNESDAY 16 MARCH 2016 AT 13:30

VENUE
BRANDWAGT 14/728

Notes for the Record prepared by:
Savannah Environmental
Please address any comments to Gabriele Wood at the above address.

MEETING:

WOODHOUSE PV 1 AND 2 SOLAR ENERGY FACILITIES, NORTH WEST PROVINCE

Venue: Farm Brandwagt 14/728
Date: Wednesday 16 March 2016
Time: 16:00

WELCOME AND INTRODUCTION

Candice Hunter of Savannah Environmental welcomed Mr van der Vyver and introduced herself as the Social Consultant from Savannah Environmental. She noted that Genesis Woodhouse Solar 1 (Pty) Ltd and Woodhouse Solar 2 (Pty) Ltd proposes the development of commercial photovoltaic (PV) solar energy facilities, known as the Woodhouse Solar 1 PV Facility and Woodhouse Solar 2 PV Facility, as well as associated infrastructure on the Remaining Extent of the farm Woodhouse 729 which is located approximately 10km south east of Vryburg in the North West Province. She explained that Savannah Environmental has been appointed as the independent environmental consultancy to undertake the Environmental Impact Assessment (EIA) for the project.

Candice Hunter thanked Mr van der Vyver for the opportunity to brief him about the proposed project. She noted that the purpose of the meeting was to present the background of the project, provide an overview of the environmental assessment process and discuss any potential social issues and concerns with the proposed developments.

MEETING ATTENDEES

Name	Organisation & Position
JD van der Vyver (JvdV)	Adjacent Landowner – • Farm Brandwagt RE/2/728 • Brandwagt 14/728 • Lockerbie RE/1/727
Candice Hunter (CH)	Savannah Environmental –Social Consultant

APOLOGIES

None

BACKGROUND & TECHNICAL ASPECTS REGARDING THE PROPOSED PROJECT

Candice Hunter discussed the background and introduction to the project and the Environmental Impact Assessment process. A Background Information Document (BID) and a map including the location of the proposed developments were presented.

DISCUSSION SESSION

Question / Comment	Response
JvdV: What impact will the proposed project have on the rainfall patterns? Do the panels absorb the heat?	CH: There is no scientific evidence of PV plants having an impact on rainfall patters in a region. Yes, the panels absorb the sun's rays.
JvdV: There is a pan situated where the layouts are planned.	CH: The specialists have identified the sensitive area. It might be a degraded area. The specialists will go out on site to determine the sensitivity of this area.
JvdV: I own Farm Brandwagt RE/2/728, Brandwagt 14/728 and farm Lockerbie RE/1/727. The developer can contact me if they would like to utilise some of my land for the PV developments.	CH: Noted.
JvdV: I am also representing Mr Olivier (one of the adjacent landowners- farm Brandwagt 8/728). He has informed me that he is planning to fence off a part of his property and utilise it for hunting purposes. There may be a possibility that some of the PV panels can get damaged from the hunting activities (shooting).	CH: The proposed developments are planned to be located south of the R34. Woodhouse Solar 1 PV facility will be located approximately 3km south east of farm Brandwagt 8/728. Therefore it is unlikely that the hunting activities (shooting) will impact the PV panels.
CH: What activities are currently taking place on your farms: • Farm Brandwagt RE/2/728 • Brandwagt 14/728	JvdV: Cattle farming activities.

Question / Comment	Response
• Lockerbie RE/1/727	
CH: Do you live on any of the Farms?	JvdV: I live on farm Brandwagt 14/728, just north of the R34. One of the labourers also lives on the farm.
CH: Are there any tenants and/or any farm workers residing on any of the Farms?	JvdV: No, just one of the farm workers lives on my farm.
CH: Are there any homesteads or building on any of the farms?	JvdV: Just the farm houses and buildings that we live in on Farm Brandwagt 14/728 (just north of R34).
JvdV: Will they clear the vegetation? Grass as well? What about the impact of rain water and erosion? If everything is cleared, there will be a lot of dust when the wind is blowing.	CH: Yes, they will clear the whole areas vegetation, including grass. The impacts of erosion will be investigated during the EIA phase and mitigation measures will be suggested to minimise these impacts. Dust suppression measures would be implemented during the construction phase to reduce the impacts of dust.
CH: Do you have any other issues or concerns with the proposed PV developments in terms of noise, dust, traffic impacts, visual impacts and safety and security concerns?	JvdV: No, I don't have any other issues or concerns. I won't be impacted by the development visually. The project won't impact me. There might be cumulative impacts when all of the solar farms are constructed.

WAY FORWARD AND CLOSURE

In closing Candice noted that the EIA Report will be made available for public review in the next few weeks and that Interested and Affected Parties could submit their written comments on the EIA process and proposed project to Savannah Environmental. She noted that the comments received would be included in the EIA Report that will be submitted to the Department of Environmental Affairs. She thanked Mr van der Vyver for the inputs which were provided. The meeting was closed at 16:30.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

WOODHOUSE SOLAR 1 AND 2 PV FACILITIES, NORTH WEST PROVINCE

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SOCIAL IMPACT ASSESSMENT (SIA) PROCESS

NOTES OF THE MEETING: ADJACENT LANDOWNER- S. BADENHORST (FARM BERNAUW 32/674)

Held on:
THURSDAY 17 MARCH 2016 AT 10:30

Venue:
Vryburg

Notes for the Record prepared by:
Savannah Environmental
Please address any comments to Gabriele Wood at the above address.

MEETING:

WOODHOUSE PV 1 AND 2 SOLAR ENERGY FACILITIES, NORTH WEST PROVINCE

Venue: Vryburg
Date: Thursday 17 March 2016
Time: 10:30-11:00

WELCOME AND INTRODUCTION

Candice Hunter of Savannah Environmental welcomed Mr Badenhorst and introduced herself as the Social Consultant from Savannah Environmental. She noted that Genesis Woodhouse Solar 1 (Pty) Ltd and Woodhouse Solar 2 (Pty) Ltd proposes the development of commercial photovoltaic (PV) solar energy facilities, known as the Woodhouse Solar 1 PV Facility and Woodhouse Solar 2 PV Facility, as well as associated infrastructure on the Remaining Extent of the farm Woodhouse 729 which is located approximately 10km south east of Vryburg in the North West Province. She explained that Savannah Environmental has been appointed as the independent environmental consultancy to undertake the Environmental Impact Assessment (EIA) for the project.

Candice Hunter thanked Mr Badenhorst for the opportunity to brief him about the proposed project. She noted that the purpose of the meeting was to present the background of the project, provide an overview of the environmental assessment process and discuss any potential social issues and concerns with the proposed developments.

MEETING ATTENDEES

Name	Organisation & Position
S. Badenhorst (SB)	Adjacent Landowner – Farm Bernauw 32/674
Candice Hunter (CH)	Savannah Environmental – Social Consultant

APOLOGIES

None

BACKGROUND & TECHNICAL ASPECTS REGARDING THE PROPOSED PROJECT

Candice Hunter presented the background and introduction to the project and the Environmental Impact Assessment process. She presented a map including the location of the proposed development.

DISCUSSION SESSION

Question / Comment	Response
SB: Where else are you undertaking EIA for solar developments?	CH: We are undertaking numerous EIA's for projects all over South Africa, especially in the Northern Cape Province.
SB: What will the water be used for during the initial phase?	CH: Normal construction activities and during the operational phase water will be used for the washing the solar panels.
SB: Who are the developers for these projects? Are they foreigners?	CH: Genesis Eco Energy Developments (Pty) Ltd. They are a South African company.
SB: Have there been any oppositions regarding the project?	CH: There hasn't been any major issues or concerns raised at this stage.
SB: How long will it be before the project starts with construction?	CH: We are currently undertaking the EIA. After the project has received environmental authorization, it will then be bid to the DoE. The developers are planning to bid the project in the next round which will be last quarter of 2016. If the project is awarded preferred bidder status then the development will commence. SB: So is it likely that the project many not be happen? CH: The projects need to be awarded preferred bidder status before they can commence with construction.
CH: Do have any concerns with the proposed solar developments in terms of safety & security, noise, dust, traffic and visual?	SB: No, I do not have any issues. I will contact you if I have any concerns.

WAY FORWARD AND CLOSURE

In closing Candice Hunter noted that the EIA report will be released in the coming weeks and the public will have an opportunity to comment on the report. The comments received from the public review will then be incorporated into the final report and thereafter it will be submitted to the Department of Environmental Affairs (DEA). Candice Hunter thanked Mr Badenhorst for the inputs which were provided. The meeting ended at 11:00.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

WOODHOUSE SOLAR 1 AND 2 PV FACILITIES, NORTH WEST CAPE PROVINCE

Savannah Environmental (Pty) Ltd
Address: PO Box 148
Sunninghill, 2157
Tel: 011 656 3237
Fax: 086 684 0547
E-mail: gabriele@savannahsa.com

SOCIAL IMPACT ASSESSMENT (SIA) PROCESS

NOTES OF THE MEETING:
ADJACENT LANDOWNER – DANIE JACOBS
(FARM BRANDWAGT RE/1/728)

Held on:
WEDNESDAY 16 MARCH 2016 AT 14:30

Venue:
Vryburg

Notes for the Record prepared by:
Savannah Environmental
Please address any comments to Gabriele Wood at the above address.

MEETING:

WOODHOUSE PV 1 AND 2 SOLAR ENERGY FACILITIES, NORTH WEST PROVINCE

Venue: Vryburg
Date: Wednesday 16 March 2015
Time: 14:30-15:00

WELCOME AND INTRODUCTION

Candice Hunter of Savannah Environmental welcomed Mr Jacobs and introduced herself as the Social Consultant from Savannah Environmental. She noted that Genesis Woodhouse Solar 1 (Pty) Ltd and Woodhouse Solar 2 (Pty) Ltd proposes the development of commercial photovoltaic (PV) solar energy facilities, known as the Woodhouse Solar 1 PV Facility and Woodhouse Solar 2 PV Facility, as well as associated infrastructure on the Remaining Extent of the farm Woodhouse 729 which is located approximately 10km south east of Vryburg in the North West Province. She explained that Savannah Environmental has been appointed as the independent environmental consultancy to undertake the Environmental Impact Assessment (EIA) for the project.

Candice Hunter thanked Mr Jacobs for the opportunity to brief him about the proposed project. She noted that the purpose of the meeting was to present the background of the project, provide an overview of the environmental assessment process and discuss any potential social issues and concerns with the proposed developments.

MEETING ATTENDEES

Name	Organisation & Position
Danie Jacobs (DJ)	Adjacent Landowner (Brandwagt RE/1/728)
Candice Hunter (CH)	Savannah Environmental – Social Consultant

APOLOGIES

None

BACKGROUND & TECHNICAL ASPECTS REGARDING THE PROPOSED PROJECT

Candice Hunter presented the background and introduction to the project and the Environmental Impact Assessment process. She presented a map including the location of the proposed development.

DISCUSSION SESSION

Question / Comment	Response
DJ: How will I be impacted by this project?	CH: Normal construction activities include noise and dust, increase in traffic, increase heavy vehicles utilising roads, visual impacts and influx of construction workers in the immediate area. The construction phase will be approximately 18 months for each PV facility. The land will also be cleared. Will any of these activities have an impact on you or your farming activities? DJ: The strongest wind comes from the north west. But the dust and noise isn't really a problem.
CH: Does anyone live on your farm?	DJ: Yes, I have people that are currently renting the house. CH: Do you think your tenants will have any concerns or problems with the proposed development? DJ: No. The house is located quite a distance away.
CH: What kind of activities do you have on your farm? Do you have any cultivated lands or game?	DJ: Livestock farming (cattle). No cultivated lands or game farming.
DJ: Do the developments need to be close to the existing power lines to connect to the Eskom grid?	CH: There are two connection options. They are currently busy with the construction of a new substation (Bophirima substation). The first option will be to connect to the new substation. The second option will be to loop into the authorised 132kV Eskom Bophirima-Mookodi overhead line (planned to be

Question / Comment	Response
	constructed soon).
DJ: Do they clean the panels?	CH: Yes, the panels are cleaned several times a year. It depends on how dusty the area is.
DJ: There isn't a lot of water on my farm. I have two boreholes on the farm, one is in use and the other one is only used in case of emergencies. These developments may have an impact on these water sources, especially being so close to the project site. How much water will be utilised?	CH: Approximately ~15 000m³ will be used for the construction phase (12 – 18 months) for each PV facility. During the operational phase (20 years), only 5 000m³ will be utilised per year, primarily for cleaning the solar panels. Water tables will be taken into consideration by the developer. DJ: That is not a lot of water at all. We use approximately ~30 000 liters per month. The developments utilising borehole water supply isn't a concern or an issue then.
CH: Is your property fenced off? A lot of landowners have complaints regarding theft and security.	DJ: My farm is fenced off. I don't think I will be impacted by the proposed developments, they are quite a distance away from my property.
DJ: Will the developer buy farm Woodhouse RE/729?	CH: The developer will be leasing the areas on the farm from the landowner.
CH: Do you have any other issues or concerns with the proposed PV developments in terms of noise, dust, traffic impacts, visual impacts and safety and security concerns?	DJ: No, I don't have any other issues or concerns.

WAY FORWARD AND CLOSURE

In closing Candice Hunter noted that the EIA report will be released in the coming weeks and the public will have an opportunity to comment on the report. The comments received from the public review will then be incorporated into the final report and thereafter it will be submitted to the Department of Environmental Affairs (DEA). Candice Hunter thanked Mr Jacobs for his inputs which were provided. The meeting ended at 15:00.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

WOODHOUSE SOLAR 1 AND 2 PV FACILITIES, NORTH WEST PROVINCE

Savannah Environmental (Pty) Ltd
Address: PO Box 148
Sunninghill, 2157
Tel: 011 656 3237
Fax: 086 684 0547
E-mail: gabriele@savannahsa.com

SOCIAL IMPACT ASSESSMENT (SIA) PROCESS

NOTES OF THE MEETING: NALEDI LOCAL MUNICIPALITY -

Held on:
THURSDAY 17 MARCH 2016 AT 09:30

Venue:
19 Market Street, Vryburg

Notes for the Record prepared by:
Savannah Environmental
Please address any comments to Gabriele Wood at the above address.

MEETING:

WOODHOUSE PV 1 AND 2 SOLAR ENERGY FACILITIES, NORTH WEST PROVINCE

Venue: 19 Market Street, Vryburg
Date: Thursday 17 March 2016
Time: 09:30-10:00

WELCOME AND INTRODUCTION

Candice Hunter of Savannah Environmental welcomed all in attendance and introduced herself as the Social Consultant from Savannah Environmental. She noted that Genesis Woodhouse Solar 1 (Pty) Ltd and Woodhouse Solar 2 (Pty) Ltd proposes the development of commercial photovoltaic (PV) solar energy facilities, known as the Woodhouse Solar 1 PV Facility and Woodhouse Solar 2 PV Facility, as well as associated infrastructure on the Remaining Extent of the farm Woodhouse 729 which is located approximately 10km south east of Vryburg in the North West Province. She explained that Savannah Environmental has been appointed as the independent environmental consultancy to undertake the Environmental Impact Assessment (EIA) for the project.

Candice Hunter thanked all in attendance for the opportunity to brief him about the proposed project. She noted that the purpose of the meeting was to present the background of the project, provide an overview of the environmental assessment process and discuss any potential social issues and concerns with the proposed developments.

MEETING ATTENDEES

Name	Organisation & Position
Arnold Manamela (AM)	Naledi Local Municipality – Town Planner
Gilbert Setlhoho (GS)	Naledi Local Municipality – Manager Electricity
Candice Hunter (CH)	Savannah Environmental – Social Consultant

APOLOGIES

None

BACKGROUND & TECHNICAL ASPECTS REGARDING THE PROPOSED PROJECT

Candice Hunter presented the background and introduction to the project and the Environmental Impact Assessment process. She presented a map including the location of the proposed development.

DISCUSSION SESSION

Question / Comment	Response
AM: What is the name of the farm where the developments are proposed?	CH: The Remaining Extent of Woodhouse 729.
GS: Where are they planning to connect the project to?	CH: There are two connection options. They are currently busy with the construction of a new substation (Bophirima substation). The first option will be to connect to the new substation. The second option will be to loop into the authorised 132kV Eskom Bophirima-Mookodi overhead line (planned to be constructed soon).
AM: Will you be able to notify us with a letter and include a copy of the EIA report.	CH: Yes, a CD will be sent to the Municipal Manager. We will add you to our database and then you'll receive the letter notifying you when the report is available for review on our website.
GS: Have you consulted with Eskom for connection?	CH: The developers will be consulting with Eskom. We are only undertaking the EIA for the project.
GS: Who are the developers?	CH: Genesis Eco Energy Projects (Pty) Ltd
AM: The developer will need and land use application as the land is listed under agricultural land use. This will be part of our comments on the EIA report. I'll recommend that this process runs concurrently with the EIA process.	CH: Noted.
AM: Has the power line corridor to Mookgadi already been assessed?	CH: Yes, that is an already an authorised Eskom corridor. The developer is planning to loop into the authorised 132kV Eskom Bophirima-Mookodi overhead line.
AM: Are they planning to connect somewhere along the power line?	CH: Yes, they are planning to loop in and loop out near the R34, this will be confirmed at a later stage.

Question / Comment	Response
AM: We as the municipality support the projects as there will be an increase in employment opportunities.	CH: Noted. The construction phase for each plant will be approximately 18 months of and approximately ~400 employment opportunities will be available. For the operational phase, approximately ~40 employment opportunities will be available (to clean the panels, security).
GS: How long will the contract be with the landowner?	CH: The developer will lease the areas on the farm for the developments. The operation phase for each development will be approximately ~20 years.
CH: Do you have any other concerns or issues with the proposed developments?	AM: No, we support these developments and we are hoping that they become preferred bidders.

WAY FORWARD AND CLOSURE

In closing Candice Hunter noted that the EIA report will be released in the coming weeks and the public will have an opportunity to comment on the report. The comments received from the public review will then be incorporated into the final report and thereafter it will be submitted to the Department of Environmental Affairs (DEA). Candice Hunter thanked all in attendance for availing themselves for the meeting. The meeting ended at 10:00.

APPENDIX C: DECLARATION OF INDEPENDENCE AND CV

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEAT/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014

PROJECT TITLE

Proposed Woodhouse Solar 2 PV facility and associated infrastructure near Vryburg, North West Province

Specialist:	Candice Hunter		
Contact person:	Candice Hunter		
Postal address:	PO Box 148, Sunninghill		
Postal code:	2157	Cell:	
Telephone:	*(011) 656 3237*	Fax:	*086 684 0547*
E-mail:	candice@savannahsa.com		
Professional affiliation(s) (if any)			

Project Consultant:	Savannah Environmental (Pty) Ltd		
Contact person:	Jo-Anne Thomas / Karen Jodas		
Postal address:	PO Box 148, Sunninghill		
Postal code:	2157	Cell:	
Telephone:	*(011) 656 3237*	Fax:	*086 684 0547*
E-mail:	Joanne@savannahsa.com / Karen@savannahsa.com		

4.2 The specialist appointed in terms of the Regulations_

I, Candice Hunter ,

declare that --

General declaration:

- I act as the independent specialists 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 71 and is punishable in terms of section 24F of the Act.**

Signature of the specialist:

Savannah Environmental (Pty) Ltd

Name of company (if applicable):

15 April 2016

Date:

SIA SPECIALIST CV:

CURRICULUM VITAE
CANDICE HUNTER

Profession	:	Social Consultant
Specialisation	:	Social Impact Assessments (SIA)
Years' experience	:	2 years and 4 months

KEY RESPONSIBILITIES

Specific responsibilities as a Social Consultant involve conducting field research; socio-economic surveys; the management and analysis of data; undertaking stakeholder engagement and communication processes; socio-economic baseline data analyses and conducting general social research for a variety of projects. This includes managing and coordinating the Social Impact Assessment (SIA) processes and compiling SIA reports in line with the countries guidelines and legislation.

SKILLS BASE AND CORE COMPETENCIES

» Social Impact Assessments (SIA)
» EIA Legislation
» Data gathering and analysis
» Qualitative and quantitative social research
» Field research and socio-economic surveys
» Baseline socio-economic data analyses
» Stakeholder engagement
» Public participation process
» Communication and community facilitation
» Report writing and review
» Project administration

EDUCATION AND PROFESSIONAL STATUS

Degrees:

M. A. Environmental Management: University of Johannesburg (2013)

B.A. Honours Tourism Development (Cum Laude): University of Johannesburg (2010)

Courses:

Advanced Certificate in Social Impact Assessment (SIA) (Cum Laude): University of Johannesburg (2013)

Certificate in Global Reporting Initiative (GRI), Sustainability Reporting Process: Environmental & Sustainable Solutions CC (2012)

Publications:

Hunter, C. & Mearns, K. (2015). Assessing the sustainability reporting of selected tourism companies listed on the Johannesburg Stock Exchange (JSE). *African Journal of Hospitality, Tourism and Leisure, 4(1): 1-18.* Publication URL: http://www.ajhtl.com/uploads/7/1/6/3/7163688/article_51_vol.4__1__2015.pdf

EMPLOYMENT

January 2014 – Current:
Savannah Environmental (Pty) Ltd: Social Consultant

February 2011 – January 2013:
University of Johannesburg: Department of Geography, Environmental and Energy Studies & School of Tourism and Hospitality (STH): Student and Research Assistant.

PROJECT EXPERIENCE

Social Impact Assessment Reports:
January 2014: Specialist SIA study for the proposed Gihon Solar Energy Facility & Associated Infrastructure Located near Bela-Bela, Limpopo Province (for Networx SA)
March 2014: Specialist social scoping study for the proposed Exheredo Photovoltaic (PV) Solar Energy Facility and associated infrastructure located near Kenhardt, Northern Cape Province (for Kotulo Tsatsi Energy (Pty) Ltd)
May 2014: Specialist social scoping study for the proposed Wolmaransstad Municipality Solar Energy Facility and associated infrastructure near Wolmaransstad, North West Province (for Bluewave Capital (Pty) Ltd)
July 2014: Specialist SIA study for the proposed Newcastle Solar Energy Facility near Newcastle, KwaZulu Natal (for Building Energy SpA)
July 2014: Specialist SIA study for the proposed Pongola Solar Energy Facility near Pongola, KwaZulu Natal (for Building Energy SpA)
July 2014: Specialist SIA study for the proposed Senekal 1 Solar Energy Facility near Mkuze, KwaZulu Natal (for Building Energy SpA)
July 2014: Specialist SIA study for the proposed Senekal 2 Solar Energy Facility near Mkuze, KwaZulu Natal (for Building Energy SpA)
October 2014: Specialist SIA study for the proposed Kotulo Tsatsi Energy Concentrated Solar Power (CSP) Tower Plant 3 facility and associated infrastructure located near Kenhardt, Northern Cape Province (for Kotulo Tsatsi Energy (Pty) Ltd)
November 2014: Specialist social scoping study for the proposed Lethabo Solar Energy Facility and associated infrastructure near Sasolburg, Free State Province (for Eskom Holdings (SOC) Limited)
November 2014: Specialist social scoping study for the proposed Majuba Solar Energy Facility and associated infrastructure near Amesforort, Mpumalanga Province (for Eskom Holdings (SOC) Limited)
November 2014: Specialist social scoping study for the proposed Tutuka Solar Energy Facility and associated infrastructure near Standerton, Mpumalanga Province (for Eskom Holdings (SOC) Limited)
December 2014: Specialist social scoping study for the proposed 120MW CPV Facility and associated infrastructure near Vryburg, Northern Cape Province (for Lambrius Energy (Pty) Ltd)

Social Impact Assessment Reports:

February 2015: Specialist SIA study for the proposed realignment of the N10 to facilitate access to the Ilanga CSP Facility site, east of Vryburg, Northern Cape Province (for SANRL)
March 2015: Specialist social scoping study for the proposed Beaufort West Solar Power Plant 1 near Beaufort West, Western Cape Province (for Beaufort West Solar Company 1 (Pty) Ltd)
March 2015: Specialist social scoping study for the proposed Beaufort West Solar Power Plant 2 near Beaufort West, Western Cape Province (for Beaufort West Solar Company 2 (Pty) Ltd)
March 2015: Specialist social scoping study for the proposed Beaufort West Solar Power Plant 3 near Beaufort West, Western Cape Province (for Beaufort West Solar Company 3 (Pty) Ltd)
June 2015: Specialist social scoping report for the proposed Buffels Solar 1 and Solar 2 Solar Energy Facilities, near Orkney, North West Province (for Kabi Solar (Pty) Ltd)
July 2015: Specialist SIA study for the proposed Lethabo Solar Energy Facility and associated infrastructure near Sasolburg, Free State Province (for Eskom Holdings (SOC) Limited)
July 2015: Specialist SIA study for the proposed Majuba Solar Energy Facility and associated infrastructure near Amesforort, Mpumalanga Province (for Eskom Holdings (SOC) Limited)
July 2015: Specialist SIA study for the proposed Tutuka Solar Energy Facility and associated infrastructure near Standerton, Mpumalanga Province (for Eskom Holdings (SOC) Limited)
August 2015: Specialist social scoping report for the proposed Paulputs CSP Tower Facility and associated infrastructure, near Pofadder, Northern Cape Province (for Abengoa Solar Power South Africa (Pty) Ltd)
September 2015: Specialist SIA study for the proposed AEP Bloemsmond Solar 1 and Solar 2 PV Facilities, near Vryburg, Northern Cape Province (for AEP Bloemsmond Solar 1 (Pty) Ltd)
October 2015: Specialist social scoping report for the proposed Woodhouse Solar 2 and Woodhouse Solar 2 PV Facilities, near Vryburg, North West Province (for Genesis Woodhouse Solar 2 (Pty) Ltd and Genesis Woodhouse Solar 2 (Pty) Ltd)
October 2015: Specialist social scoping report for the proposed Saldanha Bay Netwrok Strengthening Project, Western Cape Province (for Eskom Holdings SOC Limited)
October 2015: Specialist social scoping report for the proposed Karoshoek Solar Valley Park- Additional CSP Facilities, near Vryburg, Northern Cape Province (for FG Emvelo (Pty) Ltd)
November 2015: Specialist social scoping report for the proposed Sol Invictus Solar Development and associated infrastructure near Aggeneys, Northern Cape Province (for Building Energy (Pty) Ltd)
November 2015: Specialist social scoping report for the proposed Orkney Solar Development and associated infrastructure near Orkney, North West Province (for Genesis Orkney Solar (Pty) Ltd)
November 2015: Specialist social scoping report for the proposed Gas to Power Plant on a site withnin the Richards Bay Industrial Development Zone, KwaZulu Natal Province (for Richards Bay Gas to Power 2 (Pty) Ltd)

December 2015: Specialist social scoping report for the proposed Noupoort Concentrated Solar Power (CSP) Project and associated infrastructure near Noupoort, Northern Cape Province (for Cresco Energy (Pty) Ltd)
December 2015: Specialist social scoping study for the proposed Beaufort West PV 1 and PV 2 and associated infrastructure near Beaufort West, Western Cape Province (for Turquoise Hive Solar (Pty) Ltd)
December 2015: Specialist social scoping study for the proposed Metals Industrial Cluster and associated infrastructure near Kuruman, Northern Cape Province (for the Northern Cape Department of Economic Development and Tourism)
December 2015: Specialist social scoping study for the proposed Karoshoek Solar Valley Development- Additional CSP Tower Plant, near Vryburg, Northern Cape Province (for FG Emvelo (Pty) Ltd)
December 2015: Specialist social scoping study for the proposed Karoshoek Solar Valley Development- Additional CSP Trough Plant, near Vryburg, Northern Cape Province (for FG Emvelo (Pty) Ltd)
December 2015: Specialist social scoping study for the proposed Ilanga CSP 7 and 8 facilities and associated infrastructure within the Karoshoek Solar Valley Development, near Vryburg, Northern Cape Province (for Emvelo Eco Projects (Pty) Ltd)
December 2015: Specialist social scoping study for the proposed Ilanga CSP 9 facility and associated infrastructure within the Karoshoek Solar Valley Development, near Vryburg, Northern Cape Province (for Emvelo Eco Projects (Pty) Ltd)
January 2016: Specialist social scoping study for the proposed Semonkong Wind Farm near Semonkong, Lesotho (for Sun Clean Energy Technologies (Pty) Ltd)
Other Projects:
June 2014: Screening and pre-feasibility report- Site assessment for the proposed Wind Energy Facility near Van Reenen, KwaZulu Natal and Free State Provinces (for 4Green Development SA)
October 2015: Environmental, Social and Governance (ESG) Due Diligence- Development of the Hilton Garden Inn by United African Group, Windhoek, Namibia (for Vantage Capital)
September 2015 - February 2016: Preparation, Development and Gazetting of the Environmental Implementation Plan (EIP) 2015-2020. (for Gauteng Department of Agriculture and Rural Development)

APPENDIX D: EXTERNAL REVIEWER'S REPORT AND CV

Dr. Neville Bews & Associates
Social Impact Assessors

Committed to building high trust environments

P. O. Box 145412
Bracken Gardens
Alberton
South Africa
1452
URL: http://www.socialassessment.co.za/

Tel: +27 11 867-0462
Fax: +27 86 621-8345
Mobile: +27 82 557-3489
Skype: neville.bews
Email: bewsco@netactive.co.za

28 April, 2016

Attention: Candice Hunter

Savannah Environmental Pty Ltd

5 Woodlands Drive Office Park

Cnr Woodlands Drive and Western Service Road

Woodmead

Re: Peer review of the Social Impact Specialists Report for the Proposed Woodhouse Solar 2 PV Facility and Associated Infrastructure, near Vryburg North West Province

Having reviewed the above report I find that in essence it provides a description of the project and the social environment within which the project will unfold. It also provides an indication of the social impacts that are likely to arise as a result of the proposed project and suggests appropriate optimisation and mitigation measure.

Attached is a schedule, in accordance with Appendix 6 of the National Environmental Management Act, 1998 (ACT NO. 107 OF 1998). Environmental Impact Assessment Regulations, 2014, indicating the level of compliance of the report in respect of this regulation.

DECLARATION OF INDEPENDENCE

I, Neville Bews, as authorised representative of Dr Neville Bews & Associates hereby confirm my independence as a specialist and declare that neither I nor Dr Neville Bews & Associates have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which Dr Neville Bews & Associates was appointed as social impact assessment specialists in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for work performed. This declaration is specifically in connection with the review of the Social Impact Report for the Proposed Woodhouse Solar 2 PV Facility which is located on the Remaining Extent of Farm Woodhouse 729, situated approximately 10 km south east of Vryburg within the Naledi local and Dr Ruth Segomotsi Mompati district municipalities in the North West Province.

Signed:  Date: 28 April 2016

Appendix 6: Specialist reports	**Check**	**Comment**
A specialist report prepared in terms of these Regulations must contain-		
(a) details of-		
(i) the specialist who prepared the report; and	Section 1.3 Page 15	
(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 1.3 Page 15 & Appendix C & D	
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Appendices D & E	
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.2 Page 14	Addressed under "Terms of Reference"
(d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Not applicable	
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process;	Section 2 Page 20-26	
(f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;	Section 4. Pages 43-57	
(g) an identification of any areas to be avoided, including buffers;	None	
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figure 1 Page 19 Figure 5 Page 42 Figure 9 Page 52 Figure 11 Page 77	
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2.5 Page 26	
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;	Sections 5 Pages 57-88	
(k) any mitigation measures for inclusion in the EMPr;	Sections 5 Pages 57-88	
(l) any conditions for inclusion in the environmental authorisation;	None	
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Appendix A	

(n) a reasoned opinion-		
(i) as to whether the proposed activity or portions thereof should be authorised; and	Section 5.6 Pages 85-88	
(ii)if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 5.6 Pages 85-88	See mitigation measures, key findings and recommendations.
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Sections 2.3 Page 23-24 and Appendix B	See Table 4 Page 21 & Appendix B.
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Appendix B	
(q) any other information requested by the competent authority.	None	

EXTERNAL REVIEWER'S CV:

NEVILLE BEWS
CURRICULUM VITAE

Details and Experience of Independent Consultant

Qualifications:
University of South Africa: B.A. (Honours) – 1984
Henley Management College, United Kingdom: The Henley Post-Graduate Certificate in Management – 1997
Rand Afrikaans University: M.A. (cum laude) – 1999
Rand Afrikaans University: D. Litt. et Phil. – 2000

Projects:
The SIA for the Gautrain Rapid Rail Link; The impact assessment for the Australian – South African sports development programme; SIA for Kumba Resources, Sishen South Project; Evaluation of a Centre for Violence Against Women for The United Nations Office on Drugs and Crime; SIAs for the following Exxaro Resources Ltd.'s mines, Leeuwpan Coal Mine Delmas, Glen Douglas Dolomite Mine Henley-on-Klip, Grootegeluk Open Cast Coal Mine Lephalale; SIA for the South African National Road Agency Limited (SANRAL) on Gauteng Freeway Improvement Project (GFIP); SIA for SANRAL on the N2 Wild Coast Toll Highway; Research into research outputs of the University for the University of Johannesburg; SIA for Waterfall Wedge housing and business development in Midrand Gauteng; SIA for the Environmental Management Plan for Sedibeng District Municipality; Social and Labour Plan for the Belfast Project on behalf of Exxaro Resources Ltd; SIA for the Transnet New Multi-Product Pipeline (Commercial Farmers) on behalf of Golder Associates Africa (Pty) Ltd; SIA for the Proposed Vale Moatize Power Plant Project in Mozambique on behalf of Golder Associates Africa (Pty) Ltd; SIA for Kumba Resources Ltd.'s proposed Dingleton Resettlement Project at Sishen Iron Ore Mine on behalf of Water for Africa (Pty) Ltd; SIA for Gold Fields West Wits Project for EcoPartners; SIA for the Belfast Project for Exxaro Resources Ltd; SIA for Eskom Holdings Ltd.'s Proposed Ubertas 88/11kV Substation on behalf of KV3 Engineers (Pty) Ltd; SIA for the Mokolo and Crocodile River (West) Water Augmentation Project (MCWAP) for the Department of Water Affairs on behalf of Nemai Consulting and the Trans Caledonian Water Authority; Assisted Octagon Consulting with the SIA for Eskom's Nuclear 1 Power Plant on behalf of Arcus GIBB Engineering & Science. SIA for the 150MW Photovoltaic Power Plant and Associated Infrastructure for Italgest Energy (Pty) Ltd, on behalf of Kalahari Survey Solutions cc. SIA for Eskom Holdings Limited, Transmission Division's Neptune-Poseidon 400kV Power Line on behalf of Nemai Consulting. Ncwabeni Off-Channel Storage Dam for security of water supply in Umzumbe, KwaZulu-Natal. Social Impact assessment for Eskom Holdings

Limited, Transmission Division, Forskor-Merensky 275kV±130km Powerline and Associated Substation Works in Limpopo Province. Social impact assessment for the proposed infilling of the Model Yacht Pond at Blue Lagoon, Stiebel Place, Durban. ABC Prieska Solar Project; Proposed 75 MWp Photovoltaic Power Plant and its associated infrastructure on a portion of the remaining extent of ERF 1 Prieska, Northern Cape. Sekoko Wayland Iron Ore, Molemole Local Municipalities in Limpopo Province. Langpan Chrome Mine, Thabazimbi, Limpopo; Jozini Nodal Expansion Implementation Project, KwaZulu-Natal, on behalf of Nemai Consulting; SIA for Glen Douglas Dolomite Burning Project, Midvaal Gauteng, on behalf of Afrimat Limited; SIA for Lyttelton Dolomite mine Dolomite Burning Project, Marble Hall Limpopo on behalf of Afrimat Limited. Tubatse Strengthening Phase 1 – Senakangwedi B Integration for Eskom Transmission on behalf of Nsovo Environmental Consulting; Department of Water and Sanitation, South Africa (2014). Environmental Impact Assessment for the Mzimvubu Water Project: Social Impact Assessment DWS Report No: P WMA 12/T30/00/5314/7.

Regularly lecture in the Department of Sociology at the University of Johannesburg and collaborated with Prof. Henk Becker of Utrecht University, the Netherlands, in a joint lecture to present the Social Impact Assessment Masters course via video link between the Netherlands and South Africa and regularly lecture on this course. Presented papers on Social Impact Assessments at both national and international seminars. Published on both a national and international level.

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Registered on the database for scientific peer review of iSimangaliso GEF project outputs.