



**ENVIRONMENTAL IMPACT ASSESSMENT FOR THE
75MW KLOOFSIG 1 SOLAR PHOTOVOLTAIC (PV)
ENERGY FACILITY NEAR PETRUSVILLE, NORTHERN
CAPE**

SOCIO-ECONOMIC IMPACT STUDY

DRAFT REPORT

DECEMBER 2016



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DECLARATION OF INDEPENDENCE

I, Elena Konstantinovna Broughton, declare that:

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

Signed.....

Date.....

DECLARATION OF INDEPENDENCE

I, Zimkita Zenande Nkata, declare that:

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

Signed.....

Date.....

ACRONYMS AND ABBREVIATIONS

CAGR	Compounded Annual Growth Rate
CAPEX	Capital expenditure
CSP	Concentrated Solar Power
DM	District Municipality
EIA	Environmental Impact Assessment
FTE	Future Time Equivalent
GDP-R	Gross Domestic Product per region
GGP	Gross Geographic Product
IDP	Integrated Development Programme
IPAP	Industrial Policy Action Plan
IRP	Industrial Resource Plan
Kv	Kilovolt
LED	Local Economic Development
LM	Local Municipality
MW	Megawatt
NDP	National Development Plan
NGP	New Growth Path
OPEX	Operating expenditure
PV	Photovoltaic
RE	Renewable Energy
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SDF	Spatial Development Framework
SDI	Sustainable Development Initiative
SMME's	Small Medium and Micro-sized Enterprises

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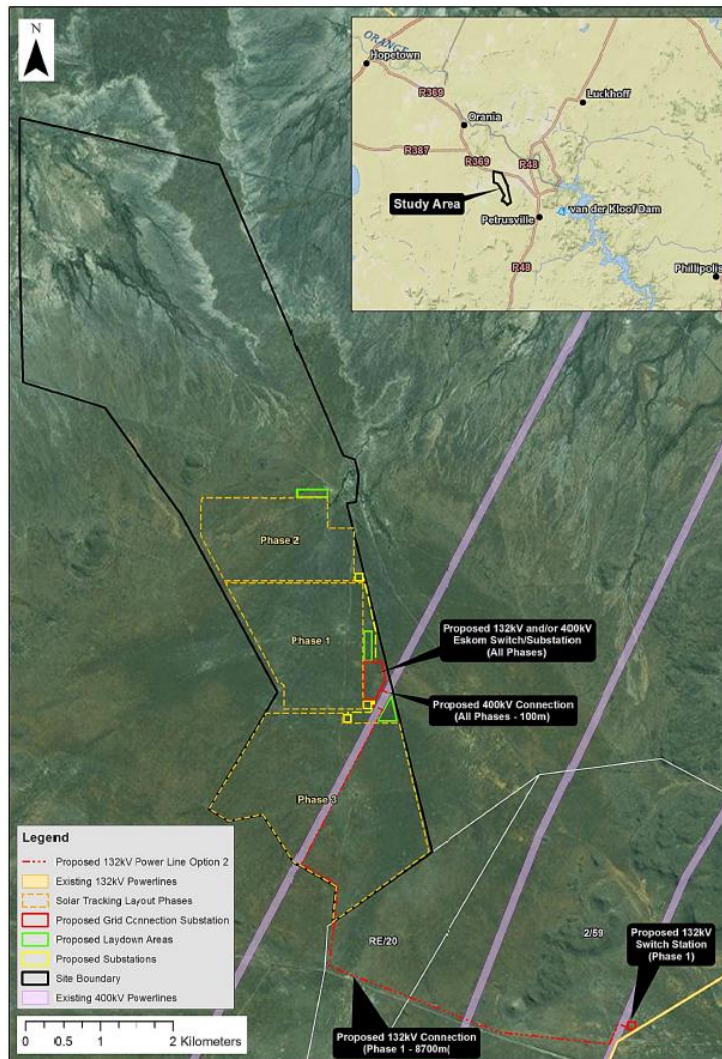
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1 INTRODUCTION

This document is prepared by **Urban-Econ Development Economists** in request by **SRK Consulting** on behalf of **Kloofsig Solar (Pty) Ltd.** to undertake a Socio-Economic Impact Study for the development of the **75MW Kloofsig 1 Solar PV energy facility** and related infrastructure near Petrusville in the Northern Cape Province. The socio-economic impact study is conducted as part of the Environmental Impact Assessment (EIA) process managed by SRK Consulting.

1.1 Brief Description of the Project

Kloofsig Solar (Pty) Ltd. proposes the development of a Solar PV energy facility near Petrusville in the Northern Cape Province, which will be developed in three phases of 75MW each (refer to Map 1-1). The 75MW Kloofsig 1 Solar PV is Phase 1 of the proposed project, which will be established on the remaining extent (Portion 0) of Kalkpoort Farm No.18.



Map 1-1: Regional Location of the project

1.2 Scope and Purpose of the Study

The socio-economic impact assessment contains information, which together with other specialists, allows assessment of the project from a sustainable development perspective and assists in identifying “the most practicable environmental option” that provides the “most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society”, in the long-term and the short-term. In light of the above and in line with the Environmental Impact Assessment (EIA) Regulations of 2014, the purpose of the socio-economic impact assessment is to assess the need and desirability of the project. It specifically aims to ensure that the project, if approved, provides for justifiable social and economic development outcomes. As such, it aims to:

- identify, predict and evaluate geographical, social, economic and cultural aspects of the environment that may be affected by the project activities and associated infrastructure
- advise on the alternatives that best avoid negative impacts or allow to manage and minimise them to acceptable levels, while optimising positive effects

The specific scope of the study includes:

- Engage with the environmental practitioner to gain necessary background on the project
- Delineate the zone of influence based on the information provided Determine the affected communities and economies located in the zone of influence and identify sensitive receptors within the delineated study area, i.e. communities, land uses and economic activities that could be directly or indirectly negatively affected by the proposed project or benefit from it
- Review secondary data and assess data gaps
- Collect primary social and economic data of the parties that may be directly or indirectly be affected (positively or negatively) by the proposed project to address data gaps using personal interviews, telephonic interviews, or e-mail Create profiles for the communities and economies representing the study areas and the environmentally affected zone
- Assess the need a desirability of the project and its alternatives in line with the specified guidelines
- Identify, predict and evaluate the potential positive and negative impacts associated with the project following the environmental specialist’s methodology
- Advise on the most suitable alternative, inclusive of the “no-go” option
- Develop a mitigation plan by proposing mitigation measures for negative effects and enhancement measures for positive impacts

1.3 Methodology

The following methodology was followed in completing the study:

1. **Orientation:** The study started with gaining an understanding of the proposed project during various stages of its lifecycle and potentially affected environment. A review of various data and maps provided for the project, as well as discussions with the project team, informed the delineation of the potential zone of influence associated with each component of the project. The delineated zone of influence defined the spatial boundaries of the area to be included in the assessment and assisted in identifying likely impacted and beneficiary communities and economic activities, as well as other stakeholders of the project.
2. **Policy alignment review:** Relevant government policies and other strategic documents were gathered and reviewed to determine the alignment of the proposed project with the strategic plans of various government spheres and highlight any potential red flags, if such exist.
3. **Baseline profiling:** Following the policy review, primary and secondary data were gathered to create the socio-economic profile of the delineated zone of influence. The baseline profile assisted in gaining an understanding of the communities and economic activities to be likely affected or benefit from the proposed project. This included description of the study area's composition and locational factors, economic and labour profiles, way of life of communities located within the zone of influence, their demographic trends and cultural references, their health and wellbeing, and their living environment. A specific attention was paid to the socio-economic composition of the area affected by the project's footprint and its potential environmental effects, i.e. visual, noise, air pollution, etc.
4. **Impact analysis and evaluation:** derived from the review of the project and its need and desirability is the list of various negative and positive socio-economic impacts that can ensue as a result of the proposed activity during various stages of its life cycle. All identified socio-economic impacts were assessed and categorised in line with the rating provided by the environmental specialist (refer to Annexure A).
5. **Need and desirability assessment:** Given the knowledge of the project and the profile of the area where it is proposed to be located, the need and desirability thereof was investigated. It involved the assessment of the project's alignment with the interests and needs of the broader public and the suitability and necessity of the project considering the chosen time and place. Ultimately, the need and desirability analysis assisted in determining whether it is the right time and the right place for locating the proposed project.
6. **Formulation of mitigation and enhancement measures:** Following the analysis and ranking of impacts, mitigation and enhancement measures, where applicable, were formulated whereby recommendations to reduce or eliminate the potential negative effects on the affected parties and enhance positive impacts were provided.

1.4 Data gathering and consultation process

The project made use of both secondary and primary data.

Secondary data gathering

Secondary data was sourced from the following databases and documents:

- Stats SA Census, 2011
- Quantec Research Standardised Regional Data, 1995-2013

- Integrated Development Plans (IDP's):
 - Pixley ka Seme District Municipality (DM) Integrated Development Programme 2015/2016 Review
 - Renosterberg Local Municipality (LM) Integrated Development Programme (2015)
- Spatial Development Frameworks (SDF's):
 - Northern Cape Provincial Development and Resource Management Plan/ Provincial Spatial Development Framework (2012)
 - Pixley ka Seme District Municipality (DM) Spatial Development Framework/ Land Development Plan (2013-2018)
 - Renosterberg Local Municipality Land Development Plan/ Spatial Development Framework (2012)
- National strategic documents:
 - National Energy Act (2008)
 - New Growth Path Framework (NGPF) (2010)
 - National Development Plan (NDP) 2030 (2011 – 2030)
 - Integrated Resource Plan (IRP) 2010-2030 promulgated in 2011
 - Industrial Policy Action Plan (IPAP2) (2016/17 – 2018/19)

Primary data gathering

The primary data gathering for this project was achieved through telephonic surveys with the identified interested and affected individuals.

The telephonic surveys were undertaken between 29 November 2016 and 08 December 2016. During this time, a total of eight interviews were completed. Six of these interviews included the owners of the directly and indirectly affected farm portions, one was with a librarian in the nearby Petrusville community, and another was with a municipal official. The last two interviews were conducted to augment the information gathered from secondary sources on the socio-economic status of the wider community, which may be affected by the proposed development.

Below is a list of all the stakeholders that were consulted by means of the telephonic interviews:

- Owners of directly and indirectly affected portions:
 - Mr Lukas Taljaard - Portion 00000 of Farm Nooitgedacht No.210
 - Dr Ron Bester - Portion 00000 of Farm Koppiesdam No.184
 - Mrs Karina Taljaard - Portion 00000 of Farm Kalkpoort No.18
 - Mrs Jenny Havenga- Portion 00000 of Farm Kalkpoort No.18
 - Mr Hauman Du Toit - Portion 00010 of Farm Outaaiboschpoort No.10
 - Mr Van Rooyen - Portion 00001 of Farm Olienberg No.49
- Members of the wider local community
 - Librarian at the Petrusville Public Library

- IDP Manager at the Renosterberg LM

1.5 Assumptions, limitations and gaps in knowledge

- The secondary data sources used to compile the socio-economic baseline (demographics, dynamics of the economy) although not exhaustive, can be viewed as being indicative of broad trends within the study area.
- The study was done with the information available to the specialist within the timeframes and specified budget.
- Possible impacts and stakeholder responses to these impacts cannot be predicted with complete accuracy, even when circumstances are similar and these predictions are based on research and years of experience, taking the specific set of circumstances into account
- It is assumed that the motivation and ensuing planning for the project were done with integrity and that all information provided to the specialist by the project proponent and its consultants to date is accurate.
- It is assumed that the project description and infrastructure components as discussed above, are reasonably accurate. These details were used to assess the potential impacts.
- With regard to the telephonic interviews undertaken, the following assumptions are made:
 - Questions asked during the interviews were answered accurately.
 - The degree of the perceived possible significance of concerns raised by some of the respondents was truthfully rated by the respondents
 - That the attitude of the respondents towards the project will remain reasonably stable over the short- to medium- terms.
- Attempts were made to contact the land owner of Portion 00011 of Farm Taaiboschpoort No.10; however, there was no timely response. The assumption is that no significant concerns will exist as the farm is located on the north-westerly side of Kloofsig 1 Solar PV energy facility. Considering the information obtained through primary as well as secondary sources, it can be concluded that the level of risk to the project associated with this knowledge gap is low.
- It is also assumed that the general concerns and opinions raised by all other land owners interviewed, such as security concerns, would also apply to the land owners not consulted with for whatever reason.

2 POLICY REVIEW

A policy review plays an integral role in the early stages of a project. The review provides a high level indication of whether a project is aligned with the goals and aspirations of the developmental policy within a country and at local level. Furthermore, the analysis signposts any red-flag or developmental concerns that could jeopardise the development of the project and assist in amending it preventing costly and unnecessary delays.

The following government strategic documents applicable to the delineated study areas were examined:

- National (South Africa):
 - National Energy Act (2008)
 - New Growth Path Framework (NGPF) (2010)
 - National Development Plan (NDP) 2030 (2011 – 2030)
 - Integrated Resource Plan (IRP) 2010-2030 promulgated in 2011
 - Industrial Policy Action Plan (IPAP2) (2016/17 – 2018/19)
- Regional:
 - Northern Cape Provincial Spatial Development Framework (2012)
- Local:
 - Pixley ka Seme District Municipality (DM) Spatial Development Framework (2007)
 - Pixley ka Seme District Municipality (DM) Integrated Development Framework (2015)
 - Renosterberg Local Municipality (LM) Spatial Development Framework (2012)
 - Renosterberg Local Municipality (LM) Integrated Development Framework (2015)

Alignment with National development objectives

The expansion of South Africa's renewable energy capacity generation will play a critical role in consolidating energy security, mitigating climate change, and stimulating economic growth to improve the general standard of living of all South Africans. Developing the Renewable Energy (RE) industry is one of the national priorities as per the following policies and strategies:

- **National Energy Act (2008):** The guiding principle behind the formation of the National Energy Act is premised on the need to ensure the adequate provision of diverse energy sources in a sustainable manner and at affordable prices to the South African residents and businesses. This will in turn, offer great support to the economic growth as well as assist in poverty alleviation through taking cognisance of the environmental management considerations as well as interactions between economic sectors.
- **New Growth Path Framework (NGPF):** The core challenge highlighted by the NGPF is the issue of mass joblessness, poverty, and inequality. These three challenges cripple the overall functionality of the country as it results in a mass divide between those who have adequate access to resources and those who are not as privileged. In light of this, the overarching purpose of the NGPF is to address the disparities by placing emphasis on the need to create

decent employment opportunities for South Africans through the support of labour-intensive sectors so as to fuel the reduction of poverty, achieve equity goals, as well as increase economic growth. To ensure sustained job creation prospects, the government has placed further emphasis on the promotion of local industry capacity and local skills development in advanced industries. In line with this vision, the NGPF has therefore, set an employment target of five million new jobs by the year 2050. The development of the Renewable Energy (RE) sector is particularly identified to have a potential in playing an important role in creating decent work opportunities, reducing inequality and eradicating poverty levels (Department of Economic Development, 2010).

- **National Development Plan (NDP):** According to the NDP, successfully overcoming the triple threat of poverty, unemployment and inequality requires that all regions seize the advantage of natural resources endowed to them. This however, must be achieved in a sustainable and equitable manner. For the goals embedded within the policy to be met, of critical importance is the proposed path toward developing and growing a green economy. In line with international protocol and ambitions, the NDP acknowledges South Africa's dependence on fossil fuel based energy production as a key challenge and this has placed further emphasis on the need to transition toward a low-carbon economy. To achieve this, the NDP seeks to ensure that half of all new electricity generating capacity is provided through renewable energy resources. This means that at least 20 000 MW of electricity should be procured from renewable resources such as solar and wind by 2030. Electricity derived from these sources will increase both the national grid capacity and replace the 11 000 MW of electricity derived from coal-powered stations.
- **Integrated Resource Plan (IRP):** The IRP, which was promulgated in 2011, was established with the purpose of serving as a living plan to monitor South Africa's forecast electricity capacity by the year 2030. The path to achieving this goal then led to the establishment of the Renewable Energy Independent Power Producer Procurement programme (RE IPPPP), which is essentially the key vehicle for securing electricity capacity from the private sector for renewable energy as well as non-renewable sources. The RE IPPPP is also premised on the goal, ensuring the generation of electricity whilst contributing to broader national development objectives such as job creation, social upliftment and widening the scope of economic ownership. Currently, the three ministerial determinations arising from the programme have called for a procurement of 13 225 MW power from renewable energy to be procured drawing from several technologies. In consideration of the four and a half bidding windows that have already been achieved, 2 292 MW have already been awarded to 45 existing Solar PV projects (Department of Energy, 2016). Furthermore, although it has not yet been promulgated, the recent IRP update suggests further power procurement through Solar PV technologies ranging from 160-720 MW by the year 2050.
- **Industrial Policy Action Plan (IPAP):** The will to continually develop and industrialise South Africa is strongly shaped by the country's response to meeting the pressure placed on all economies of the need to adopt less energy and carbon intensive production processes. The conception of the RE IPPPP is already marked as the worlds' fastest growing RE programme and South Africa's leading infrastructure development programme. As a result of it, the fourth bidding window resulted in 13 projects which are expected to contribute 1 125MW of installed capacity to the national grid. About 7000 jobs are expected to be created in the construction

phases whilst 1000 permanent jobs will be made during the operating phase of the projects. Although much work still needs to be done in developing a dynamic technology-intensive sector, green industries have been at the forefront of the impending need to meet development goals whilst reducing the pressure on the earths' non-renewable resources.

Based on the above, it can be concluded that the proposed Kloofsig 1 Solar PV energy facility supports and is in alignment with national policies insofar as it will assist in achieving the set target for electricity generation using renewables and contribute to the development of human capital and technology.

Alignment with Provincial policies

The Northern Cape Province faces numerous socio-economic and developmental challenges, which are not unique to the Province and are observed throughout the country. Reducing poverty through social development and achieving a sustainable economic growth in the Province through diversification and transformation of its economy are at the forefront of the provincial government's developmental objectives (Northern Cape Government, 2008; Office of the Premier of the Northern Cape, 2012).

The Northern Cape Province is endowed with biological diversity, mineral resources, and renewable energy sources such as solar and wind. Therefore, the achievement of its developmental objectives is envisaged to be done by capitalising on the local resources and specifically, the development of the agriculture and agro-processing, mineral extraction and mineral beneficiation, fishing and aquaculture, manufacturing, and tourism industries (Northern Cape Government, 2008; Office of the Premier of the Northern Cape, 2012).

Ensuring availability of inexpensive energy is seen to be fundamental to growing competitive industries in the Province (Northern Cape Government, 2008). However, the provincial government advocates the development of the energy sector in the Province through "the promotion of the adoption of energy applications that display a synergy with the province's natural resource endowments" (Northern Cape Government, 2008). This implies the use of renewable energy sources and natural gas fields that the Province enjoys (Northern Cape Government, 2008). Provincial strategic documents specifically promote the development of large-scale renewable energy projects, similar to the one under analysis, which among others, would contribute to renewable energy targets set by national government and allow to secure supply, tackle climate change and address the needs of the Province (Office of the Premier of the Northern Cape, 2012).

Harnessing renewables is also seen to contribute towards alleviation and reduction of poverty in the Province. One of the interventions that underpins the provincial approach to poverty eradication is the "utilisation of natural resources in a sustainable manner", which in turn implies the transition to greater exploitation of renewables, including wind and solar (Northern Cape Government, 2008).

Considering the above, it can be concluded that the development of the proposed project follows the provincial priorities and developmental objectives

The provision of electricity through renewable energy sources, such as solar, is also seen as a reliable way to promote and accelerate economic growth within the Province through ensuring that key industry users at critical locations improve their competitiveness. Although there is sufficient reason

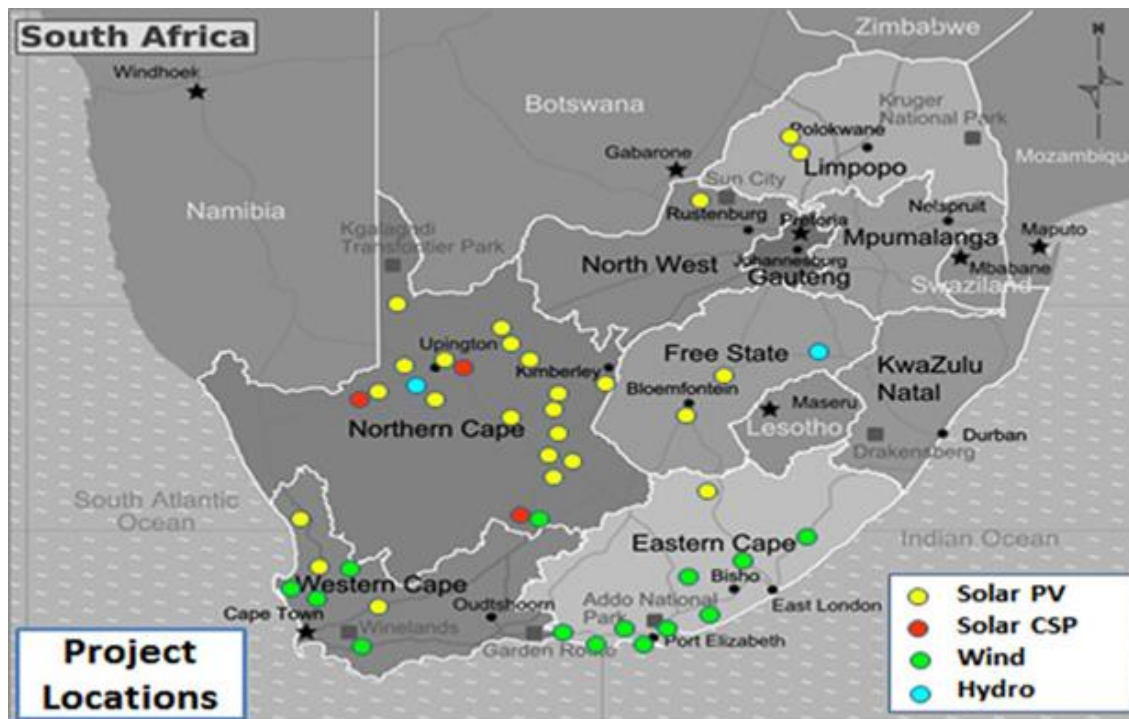
towards investing in the use of renewable energy in the Province, it is essential that potential developments be considerate of the tourism industry component of the Province.

The Northern Cape Province has had 17% average annual growth in national visitors as well as 25% annual growth of international visitors during the 2001-2011 period, resulting in a total tourism contribution of 6% toward the provincial Gross Geographic Product (GGP) (Dennis Moss Partnership, 2012). This highlights that tourism is a key sector in the Northern Cape that has the potential to grow, transform and diversify the provincial economy. This means that extra care should be taken in ensuring that renewable energy developments do not result in a negative impact on the tourism potential of the Province and nor do they interfere with the region's natural environment.

Alignment with Local and Regional Development Priorities

Although much of the focus within district and local municipalities relates to the development and delivery of basic services, infrastructure, agriculture and tourism, the development of a green economy remains to be seen as an additional fundamental pillar of growth. Thus, in accordance with the national and provincial policies, the district and local municipalities have placed considerable emphasis on the prioritisation and promotion of renewable energy resources within their boundaries. The Pixley ka Seme District Municipality and the Renosterberg Local Municipality have developed strategies to extract growth and development potential from such investments:

- **Pixley ka Seme DM Integrated Development Plan (IDP):** Upon conducting an economic development investigation for the district, several challenges were identified. These included the lack of diversification of the district economy, skills, employment opportunities, investment in the region as well as the underutilisation of the regions natural resources and economic opportunities. In consideration of the development deficit within the municipal area; the Pixley ka Seme DM therefore, vowed to do everything feasible in its power to create jobs. This included the realisation of the need to focus the districts' efforts toward advanced development activities so as to lure investors. Since then, the DM has taken bold steps in shifting away from relying on mining and agriculture, and has placed strong emphasis on diversifying the economy. Today, the Pixley ka Seme DM declares itself as a Renewable Energy Hub that seeks direct foreign investment in solar, wind, hydro and biomass projects (Pixley ka Seme IDP, 2015). This is evident in the relatively high concentration of Solar PV projects towards the south-east of the Province depicted in Map 2-1 below.



Map 2-1: Renewable energy projects distribution (Pixley ka Seme IDP, 2015)

- Renosterberg LM Integrated Development Plan (IDP):** According to this document, the economy of the Renosterberg LM epitomises the apartheid regime; thus, development patterns remain skewed among the former white areas and townships. Similar to the Pixley ka Seme DM, the Renosterberg LM experiences economic development deficits. Due to this, the upliftment of the local economy is a priority. The economy of the region has a long history as a provider of migrant labour, as most people leave the area in search for better employment opportunities (Renosterberg IDP , 2015). Therefore, any development that would allow retention of its labour force and creation of sustainable employment opportunities, which will assist in alleviating local households' living standards, will be desirable in the area.

Alignment with spatial vision and planning

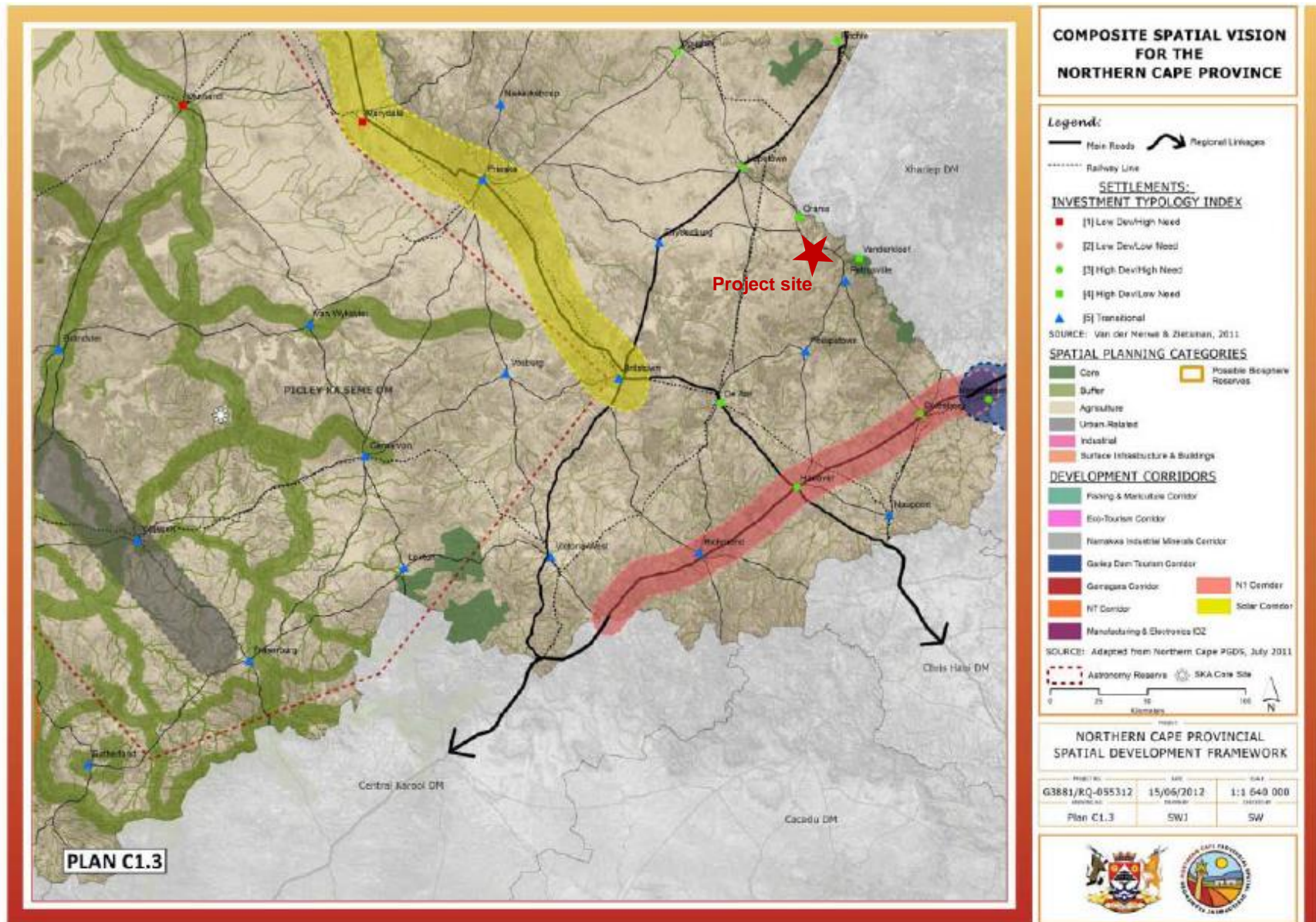
From a spatial perspective, no red flags or potential conflicts with the proposed project were identified. Moreover, the project appears to be in alignment with the vision of provincial and local spatial development frameworks:

- Northern Cape Spatial Development Framework (NC SDF):** The provincial spatial framework is premised on the vision of effectively managing the Province's resources in a sustainable and equitable manner, which will be of benefit to the people directly dependent on them. Linked to this, further stress is directed towards the importance of utilising renewable energy to address the needs of the Province prior to exporting the services to the rest of the country. Due to this, in accordance with the Sustainable Development Initiative (SDI), the establishment of a renewable energy system is to be utilised as a driver for economic development; thus, making renewable energy projects a high priority on the provincial agenda (Dennis Moss Partnership, 2012).

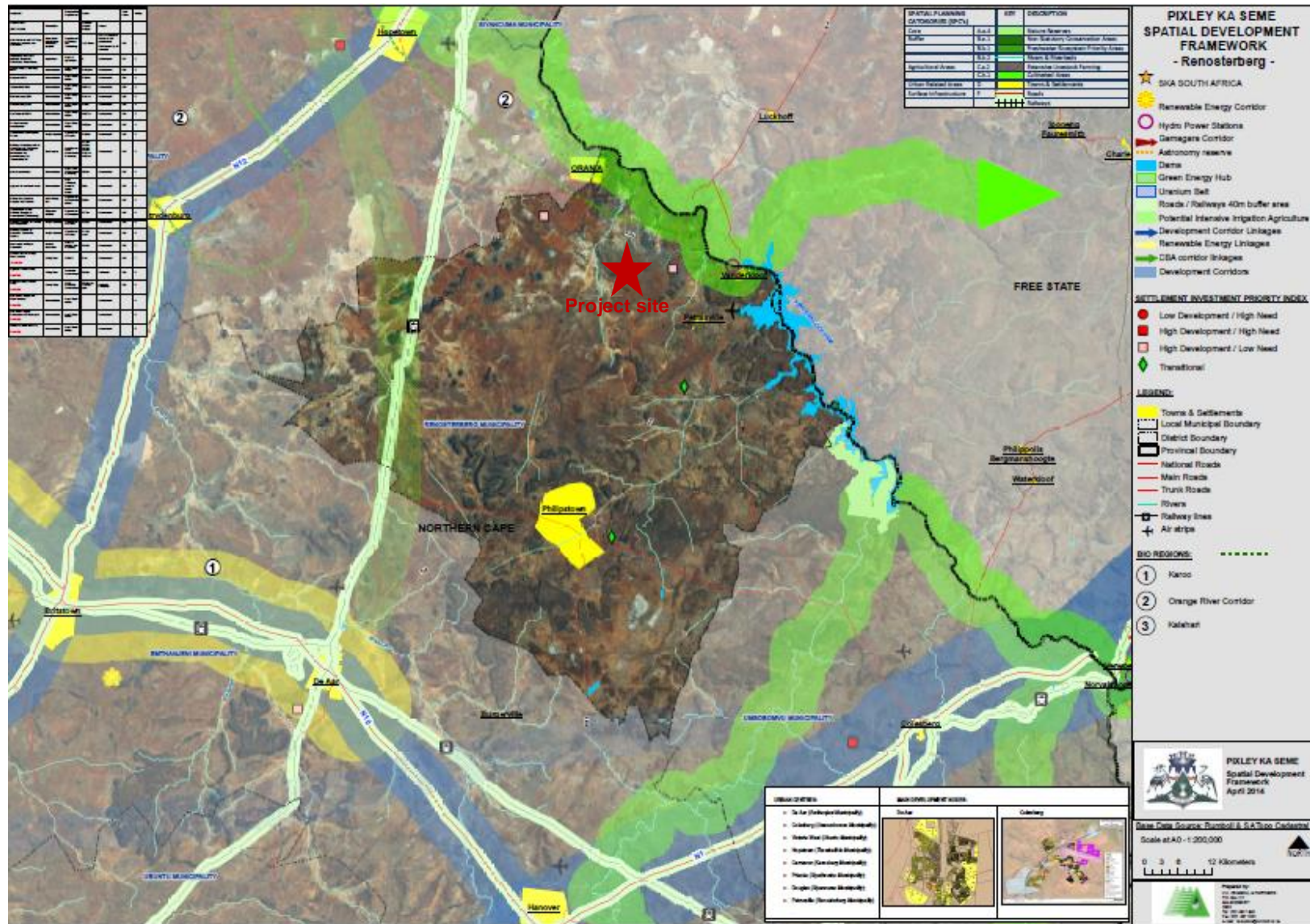
Several targets have been put in place for the generation of electricity using renewable sources. As a result of this, 25% of the Province's energy generation capacity is set to be acquired from renewable energy products such as wind, solar, thermal, biomass and hydroelectricity by the year 2020 (Dennis Moss Partnership, 2012). Focusing on renewable energy development will not only assist in diversifying the economy of the Province, but it will also be of benefit in aligning regional goals with national goals as it will add to the promotion and growth of green industries. Reviewing the NC SDF, and specifically the part of the area encompassing the project site as outlined in Map 2-2 further in the section , it can be seen that the project under analysis study will not have any potential spatial development conflicts with provincial plans.

- **Pixley ka Seme DM Spatial Development Framework (SDF):** The fast-growing renewable energy sector in the Province, as a whole, is founded on the development of zones stretching across ZF Mgcawu and the Pixley ka Seme DMs, which were specifically established to facilitate and support the development of alternate energy sources to stimulate economic growth and development. As shown in Map 2-3 further in the section, the proposed project is not in conflict with the Pixley ka Seme DM spatial vision. This can be seen in how the location of the proposed project is situated outside the green zone currently delineated for potential intensive irrigation agriculture.
- **Renosterberg LM Spatial Development Framework (SDF):** Within the Renosterberg LM, the primary delineation and description of the land is earmarked as agricultural land, however there is no other indication of a potential conflict between this land use and the proposed development. This is so because the project site as well as the adjoining farm portions are not reserved as high agricultural potential areas nor are they reserved as potential irrigated agricultural land (see Map 2-4 below). The project area is also situated far from any of the development nodes that form part of the spatial vision of the local municipality.

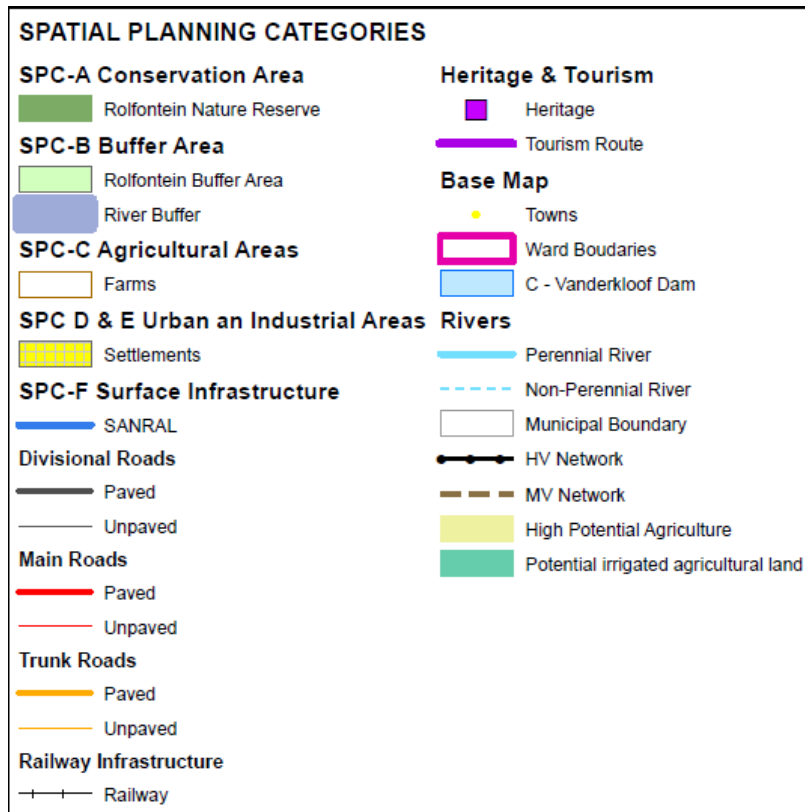
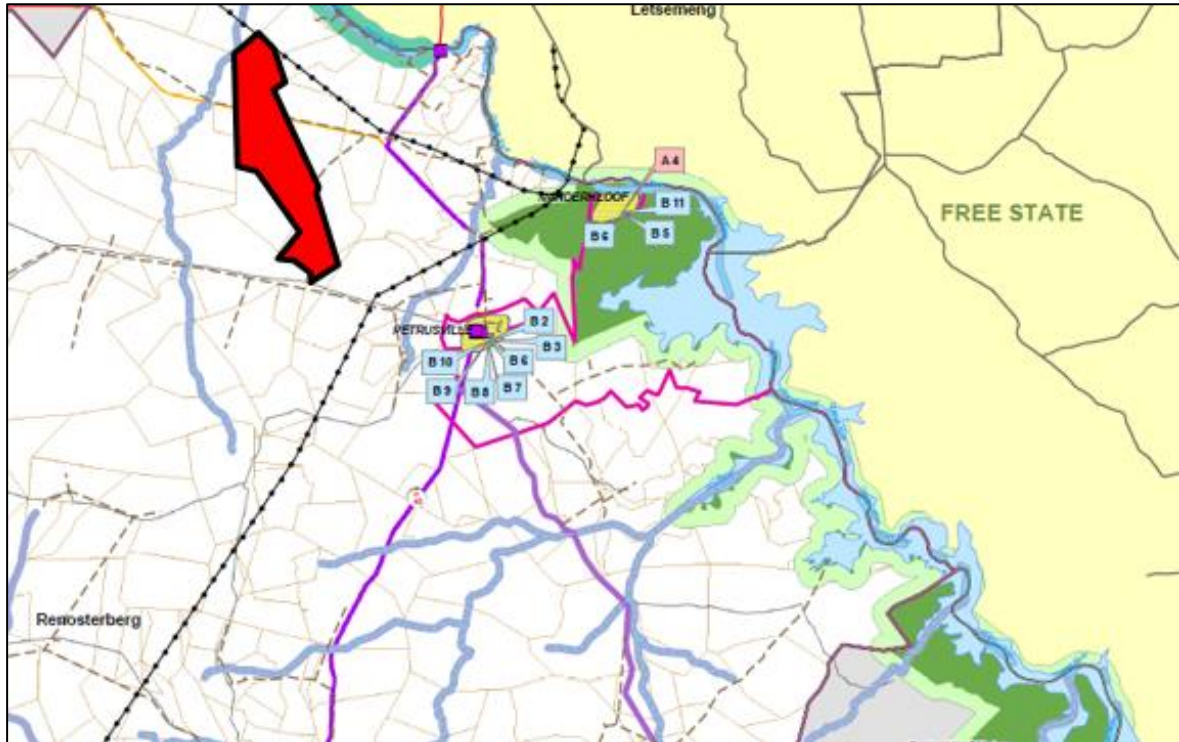
After considering the reviewed documentation, it can be concluded that the proposed Solar PV energy facility is in alignment with national, provincial and local objectives, plans, and strategies relating to the socio-economic development of the areas under analysis. There were no fatal flaws or contraventions identified as all spheres of government prioritise the development of renewable energy projects. The proposed project fits well with the plans to diversify the provincial, district and local economies through investment in renewable energy projects. However, considering the importance of the tourism industry in the economic development of the area, an investigation into the current land uses in the zone of influence of the proposed project is thus undertaken to determine economic activities within the immediate proximity of the proposed project site and assess the potential effects thereof on growth and development of this sector.



Map 2- 2 Northern Cape Spatial Development Framework (Dennis Moss Partnership, 2012)



Map 2-3: Pixley ka Seme Spatial Development Framework (SDF) (Pixley ka Seme DM SDF, 2014)



Map 2-4 Renosterberg LM Spatial Development Framework (Renosterberg LM SDF, 2012)

3 BASELINE INFORMATION

This chapter examines key socio-economic characteristics of the study area, as per delineation provided in the previous chapter. This is essential as it provides both qualitative and quantitative data related to the communities and economies under observation, creating a baseline against, which the impacts can be assessed. As previously stated, the Kloofsig 1 Solar PV is located in the Renosterberg LM, which lies within the borders of the Pixley ka Seme DM.

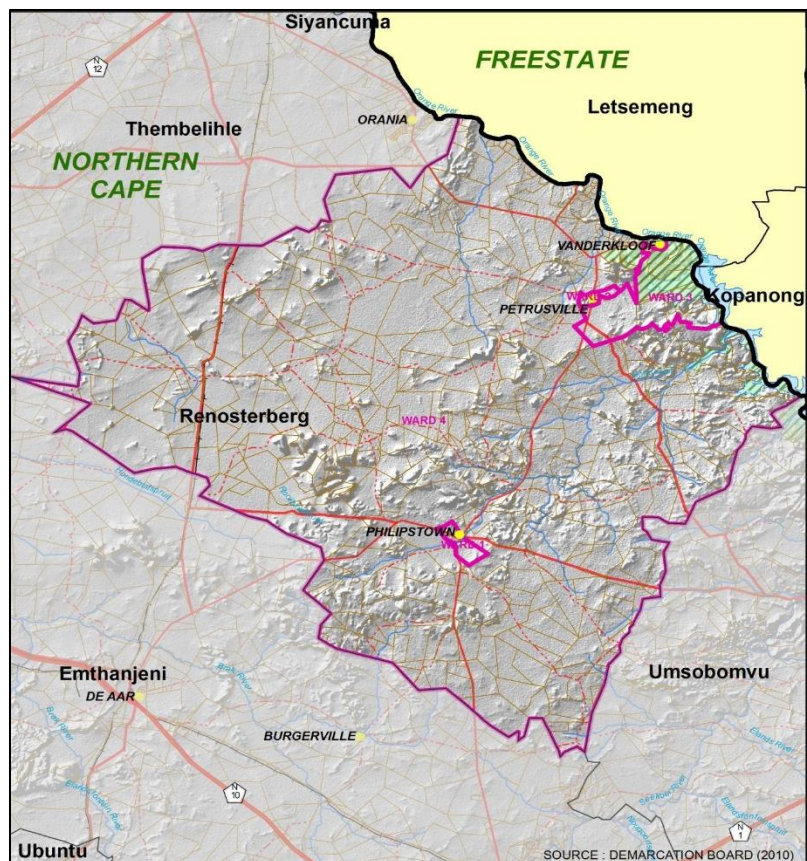
3.1 Study area's composition and locational factors

Spatial linkages and locational factors

Geographically, the **Northern Cape** is the largest province located within South Africa, with an area of 372 889km² equating to approximately 30.6% of South Africa's spatial composition. Despite having the largest surface area, the Northern Cape is the least populated province in South Africa, with a population of 1.1 million people; equating to 2.2% of the national population (Stats SA, 2011). This province is a dry and hot region classified as a semi-desert as it also experiences scarce rainfall patterns. The Northern Cape Province consists of five districts, namely Frances Baard, Pixley ka Seme, Namakwa, ZF Mgcawu (previously known as Siyanda) and John Taolo Gaetsewe.

The proposed project (Kloofsig 1 Solar PV energy facility) falls within the **Pixley ka Seme DM**, which covers a total surface area of 103 410km²; or 27.7% of the total provincial landmass. De Aar is the main seat of the DM. The Pixley ka Seme DM is bordered by the ZF Mgcawu DM on the north, the Xhariep DM toward the east, the Sarah Baartman DM on the south and the Namakwa DM on the west. Geographically, Pixley ka Seme is the second largest DM in the Province, and is the least populated district after the Namakwa DM with a population of 186 349 people, comprising 16.3% of the total province population.

In the Pixley ka Seme DM, the project falls within the borders of the **Renosterberg LM**. This LM lies on the east of the DM and is bordered by the Umsobomvu LM towards the south-east side, the Emthanjeni LM towards the west, and the Thembelihle LM toward the north-westerly side (see Map 3-1). The Renosterberg



Map 3-1: Renosterberg LM locational context (Renosterberg LM SDF, 2012)

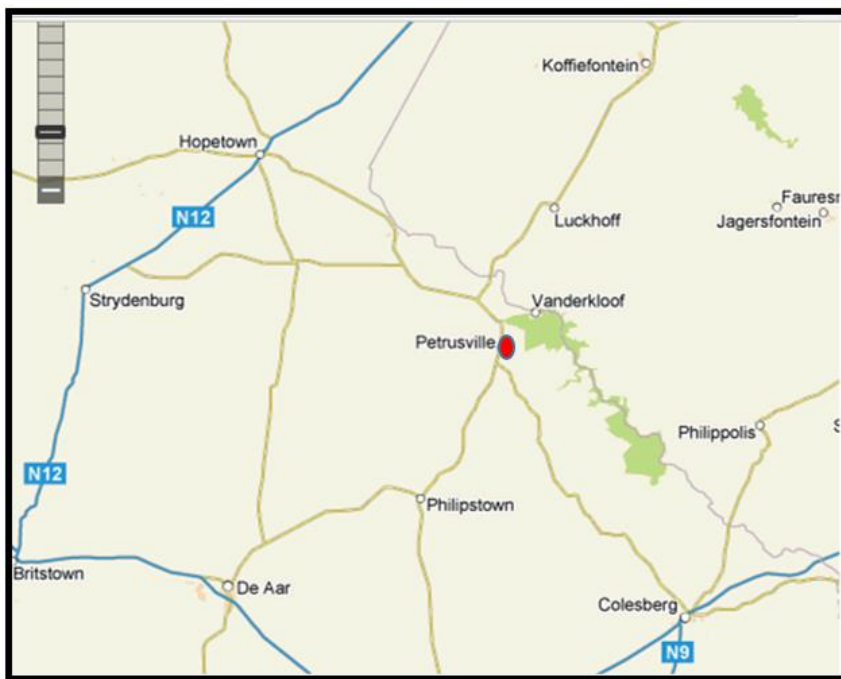
LM covers an area of 5 527km², and has a total population of 10 977 people. The LM is characterised by agricultural activities and the basic services driving the agricultural sector are provided by the two small towns of Petrusville and Phillipstown (Renosterberg LM SDF, 2012). Both the Pixley ka Seme DM as well as the Renosterberg LM are situated within the Karoo region, which is considered as the most beautiful region in the Province. The region experiences winter rainfall as well as hot to very dry summers. The main settlements of the region are Petrusville, Phillipstown, and Vanderkloof and they mainly function as agricultural service centres of the municipality.

3.2 Sense of place, history and cultural aspects

Petrusville is the closest town to the proposed Kloofsig 1 Solar PV energy facility. The town lies in a fertile valley surrounded by a cluster of high hills. It is located 45km from Phillipstown and 10km south of the Orange River. Petrusville town was established in the year 1977 by the two sons of Petrus Jacobus van der Walt on Rhenosterfontein farm (Renosterberg IDP, 2015).

Petrusville has a population of 5 212 people, since the year 2001; the population percentage increase of Petrusville is 32%. The town covers a total surface area of 58.60km² and has a population density of 88.95people/km² (Stats SA, 2011). Afrikaans (62.4%) is the most commonly spoken language, followed by isiXhosa (30.9%). By virtue of Petrusville being a town, all residents reside in the urban area. Of these, 19.3% are married whilst 68.2% have never been married (Stats SA, 2011). The dominating racial groups in the Petrusville community are Coloureds (57.3%) followed by Black people (39.3%). The economy of the town is heavily reliant on Merino sheep farming as well as small farms that lie on the banks of the Orange River where wheat, corn and lucerne is planted.

Vanderkloof town is named after the Farm it is situated in. The town was originally built for the benefit of the people who were building the **Vanderkloof Dam**. Vanderkloof was developed into a town and gained municipal status in the year 1980. Today, it solely functions as a resort and holiday destination and boasts of having the highest dam wall (108m) in the country (Northern Cape Government, 2008). Although the population figures of Vanderkloof town fluctuate from season to season, population figures recorded during the 2011 census indicate that the town has a total of 1 226 people, and a population density of 249 people/km² (Stats SA, 2011).



Map 3-2: Renosterberg LM towns

The Dam plays a prominent role in providing irrigation to more than 100 000 hectares of productive agricultural land and is home to one of only two hydroelectric power stations in the country. The Vanderkloof Dam is also integral part of the local tourism industry and is used for angling and water related sports including boating, skiing, windsurfing, kayaking and swimming. (Urban-Econ, 2012)

In addition to the Vanderkloof Dam, the Renosterberg LM is also home to the **Rolfontein Nature Reserve**. The Reserve is located on the southern shore of the dam, east of the town of Vanderkloof and comprises of approximately 8 000 ha. There are also several public and privately operated game reserves in the area surrounding the Renosterberg LM, including the **Otterskloof District Game Reserve** and the merged **Doornkloof Reserve and Hunters Moon Game Ranch**. (Urban-Econ, 2012)

The Vanderkloof Dam hosted **several events and festivals** in the past attracting domestic tourists from around the country. These included Water Festival or Waterfees, the Intervarsity Regatta, and Biker Rally. (Urban-Econ, 2012)

The Renosterberg LM, and in particular the town of Vanderkloof, offers several accommodation facilities and services for tourists. In addition to the Vanderkloof Holiday Resort, as well as several homes which are rented out over the December holiday period; there are a few year-round accommodation options in and around the town of Vanderkloof. In the past, though, some of the establishments have closed down due to declining tourists' numbers but new opened in their stead. (Urban-Econ, 2012)

Phillipstown lies on the southern periphery of the Renosterberg municipal area within an extensive farming area, serving as an urban satellite to the surrounding rural area. The town was established in the year 1863 as a church centre and named after the Governor of the Cape, Sir Phillip Wodehouse (Northern Cape Government, 2008). Sheep farming (wool and meat production) in the town is the main economic activity. The town has a population of 3 356 people, with a population density of 76.27people/km² (Stats SA, 2011).

Existing tourism related activities and attractions in the town include:

- Hunting
- Khoi-San engravings
- National monuments (Old prison museum, Reform church, Magistrates office & Teich house)
- Wire Car Grand Prix

3.3 Demographic Profile

Population demographics

The population of any geographical area is the cornerstone of the development process, as it affects the economic growth through the provision of labour and entrepreneurial skills, and determines the demand for the production output. Examining population dynamics is essential in gaining an accurate perspective of those who are likely to be affected by any prospective development or project.

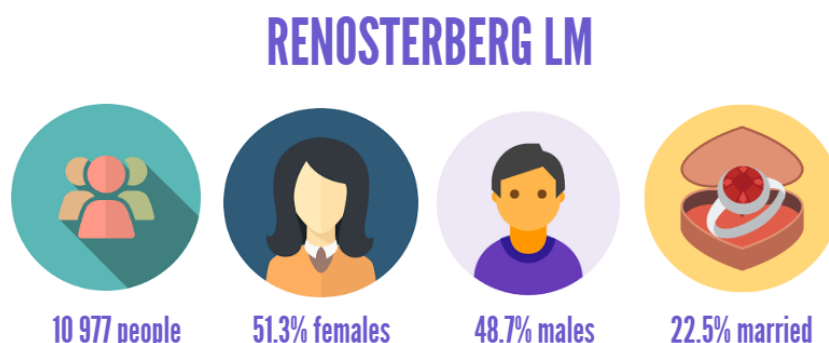


Figure 3-1: Population demographics of Renosterberg LM (Stats SA, 2011)

As previously mentioned, the **Renosterberg LM** houses 10 977 people, which accounts for 5.9% of the Pixley ka Seme DM total population. In comparison to the year 2001, the Renosterberg LM population percentage increased by 6.6%. Within the LM, 89.3% of the people reside in urban areas while the rest (10.7%) live in farms, majority of these people live in Petrusville town (Renosterberg IDP, 2015). The LM has a total of 2 994 households and a household density of 0.54 households/km² (Stats SA, 2011).

Afrikaans (70.8%) is the most commonly spoken language in this LM, followed by isiXhosa (23.6%) with the dominant races being Coloured (57.7%) and Black people (32.9%).

The Renosterberg LM population consists of 48.7% males and 51.3% females, of the male and female population, only 22.5% of the residents are married, whilst the majority (62.5%) of the residents have never been married.

The population of the Renosterberg LM is characterised by a high dependency ratio (64%), with 32.7% falling within the 0-14 age group and 6.2% falling in the age group +65 years. The largest group of people falls under the age of 15-34 years of age.

Health demographics

Assessing and monitoring the health of a particular area is beneficial as it provides useful information with regard to the development as well as human welfare of an area.

Over the past 15 years, 6% of the total population of Pixley ka Seme DM as well as the Renosterberg LM respectively reported people living with HIV. The total percentage of reported AIDS-related deaths was notably low for the DM as well as the LM, at 0.1% and 0.03% (Stats SA, 2011). The total percentage figures for National and provincial HIV infected people are much higher as 11.4% and 7.3% cases were reported, respectively.

Table 3-1: Population, HIV positive, AIDS and other deaths (2015)

Indicator	South Africa	Northern Cape	Pixley ka Seme DM	Renosterberg LM
Population	54 956 509	1 175 780	192 549	11 344
HIV positive	6 248 908	86 146	11 517	677
AIDS deaths	206 761	2 360	227	3
Other deaths	444 866	9 729	1581	77

(Quantec, 2016)

Crime demographics

In the Pixley ka Seme DM, 8 888 crimes were reported in the year 2016; of these, 7 892 were community reported crimes whilst 996 were detected by the police. Of these crimes, assault with the intent to cause bodily harm was the most frequently reported crime. In the Renosterberg LM, only 435 crimes were reported. The majority of these (92.1%) are community reported, whilst only 7.9% were investigated as a result of police detection. In total, the number of crimes reported in the LM only equate to 4,5% of the district's reported crimes and 1% of the province's total crimes.

Table 3-2: Crimes reported by crime type (2016)

Types of crime	South Africa	Northern Cape	Pixley ka Seme DM	Renosterberg LM
Serious crimes	2 126 552	49 543	8 888	435
➤ Community reported crimes	1 770 626	44 388	7 892	401
➤ Crimes dependent on police action for detection	355 926	5 155	996	34

(Quantec, 2016)

3.4 Economy

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

The **Renosterberg LM** is a small economy that is valued at R441 million in current prices. In total, the economy of the Renosterberg LM equates to 5.2% of the Pixley ka Seme DM's Gross Domestic Product per Region (GDP-R), which is valued at R8 535 million in current prices (Quantec, 2016). The contribution of the LM to the Province as a whole is significantly low as it only accounts for 0.6% of the Northern Cape Provinces' economy.

As depicted in Figure 3-2 below, during the 2006-2008 period, the Renosterberg LM has been growing at lower rates than the country and the Province. In 2009, though, it showed better resilience to the national electricity crisis and global recession. Nonetheless since then, the local economy could not recover sufficiently to achieve the pre-recession growth rates of 5% and higher, and has been growing at an average of 1.3% per annum.

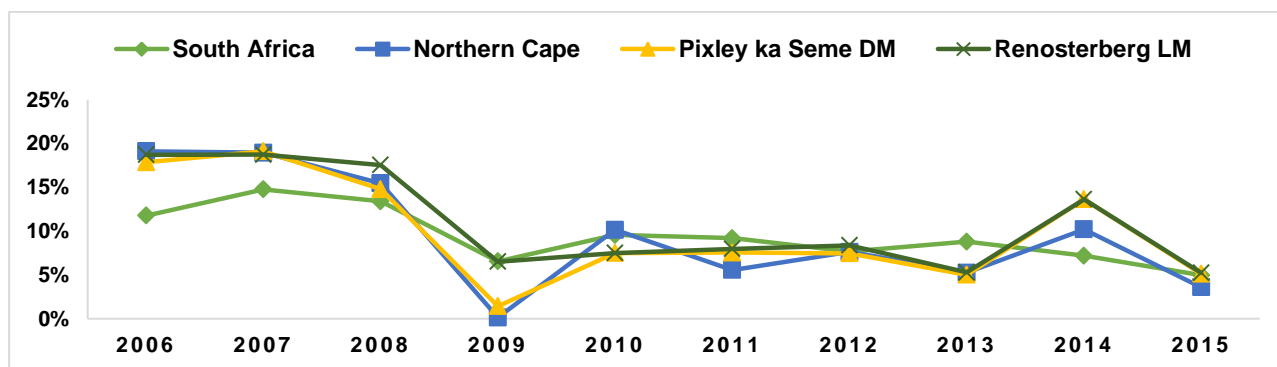


Figure 3-2: Regional economic GDP-R historical trends (Quantec, 2016)

More often than not, a diverse and sustainable economy is dependent on the strength of the primary, secondary and tertiary sectors to cater for all the consumer and business needs. In the Renosterberg LM, the dominant economic sector is the tertiary sector as it contributes the largest portion (58.4%) to the LM's GDP-R. Prominent sub-sectors within the tertiary sector include general government (22%), trade (14.6%), as well as finance and insurance (8.6%). Within the other two economic sectors, primary and secondary; the dominant contributing sub-sectors to the LM's local economy are agriculture (16.5%) and electricity, gas and water (18%), respectively. The catering and accommodation sector, which can be used as a proxy for the local tourism industry, contributed a meagre R3 million towards the local economy in 2015; thus accounting for only 0.7% of its GDP.

3.5 Labour Force and Employment Structure

Employment is the primary means by which individuals who are of working age may earn an income that will enable them to provide for their basic needs and improve their standard of living. As such, employment and unemployment rates are important indicators of socio-economic well-being.

Labour force composition

During the year 2011, the total working population of the Renosterberg LM equated to 6 709 people. Of these, 2 608 were employed and 1 001 were unemployed; resulting in a total labour force of 3 609 people. Discouraged job seekers (those capable of searching employment but have become discouraged) equalled to a total of 343 people, which is 5.9% of the total working population. Overall, the unemployment rate in the municipality was 27.7%, which is as high as the provincial (27.4%) and national (29.7%) unemployment rates. Petrusville town on the other hand has a strikingly high unemployment rate of 42.4%.

Table 3-3: National, Provincial & Regional Labour Force Profile

Town/settlement	Working age	Labour force			Discouraged job seekers	Unemployment rate
		Employed	Unemployed	Total		
South Africa	33928806	13254829	5586624	18841453	1848720	29,7%
Northern Cape	736205	284202	107379	391581	40170	27,4%
Pixley ka Seme DM	116270	43849	17566	61415	6655	28,6%
Renosterberg LM	6709	2608	1001	3609	343	27,7%
Petrusville	3145	888	655	1543	185	42,4%

(Stats SA, 2011)

Employment structure

Within the Pixley ka Seme DM, two thirds (66.2%) of the population are employed in the formal sector, whilst 19% work in the informal sector. Private households also provide employment to 13% of the municipal employed population. In the Renosterberg LM, the majority (58%) of the people are also employed in the formal sector, whilst a third work in the informal sector with a relatively low (8%) portion working for private households. Similar to the districts' trends, two thirds of people residing in Petrusville town work in the formal sector, whilst only 26% work in the informal sector. Private

households in Petrusville town provide the least employment opportunities as only 6.6% people in the town indicated they were employed in private households.

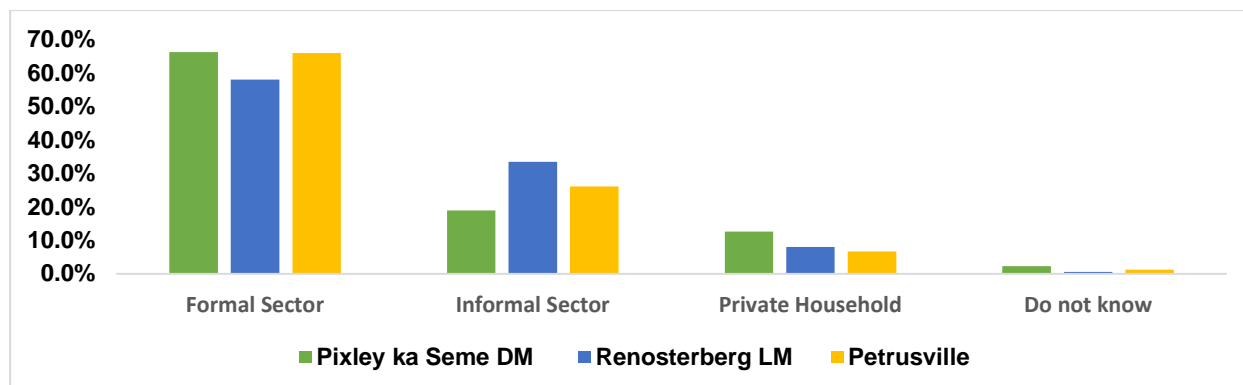


Figure 3-3 Renosterberg regional employment by sector (Stats SA, 2011)

Employed individuals in the study area possess various skills and therefore, make different contributions to the workplace. In the Pixley ka Seme DM, the formal sector has employed the most people. Within the formal sector, 11% of the total working population are considered to be skilled whilst the rest are either semi-skilled (28%) or low-skilled individuals. As tabulated below, the Renosterberg LM has less people who are skilled in the formal sector. The majority (35%) of them are low-skilled whilst 30% have informal skills (Stats SA, 2011).

Table 3-4: Employment and compensation by skill level (2015)

Skills	Employment sector & compensation by skill level			
	Pixley ka Seme DM		Renosterberg LM	
	Employment	%	Employment	%
Formal: skilled	5567	11%	252	9%
Semi-skilled	14368	28%	748	26%
Low-skilled	16922	32%	1003	35%
Informal	15263	29%	850	30%

(Quantec, 2016)

Within the Renosterberg LM, the tertiary sector is the largest contributor to formal and informal employment with a share of 56% of all employment provided within the LM. As outlined in Table 3-5 below, within the tertiary sector; general government (18%) provides the most employment opportunities followed by the trade sub-sector (16%) (Quantec, 2016). The tertiary sector is also the dominant employment provider in the district (63%) as well as at the provincial level (66%). The primary sector is the second sector to create the most employment opportunities (28%) and all the people employed in the primary sector work in the agricultural industry. The secondary sector provides the least employment at the municipal, district as well as provincial levels. However, within the secondary sector, construction is the most prominent sub-sector, providing a share of 13%, 10% and 7% at the municipal, district and Provincial level, respectively. The dominance of employment provision by the tertiary sector at the municipal level correlates with the prominence of the tertiary sector in the GDP-R contribution (Quantec, 2016).

Table 3-5: Employment by economic services in region (2015)

Economic sector	Employment by area		
	Northern Cape	Pixley ka Seme DM	Renosterberg LM

Economic sector	Employment by area					
	Northern Cape		Pixley ka Seme DM		Renosterberg LM	
Agriculture, Forestry & Fishing	58405	18%	12554	24%	810	28%
Mining and Quarrying	12047	4%	271	1%	0	0%
Manufacturing	13973	4%	1431	3%	45	2%
Electricity, gas & water	1299	0%	224	0%	35	1%
Construction	24048	7%	4953	10%	364	13%
Trade	68724	21%	10465	20%	456	16%
Transport, storage and communication	13041	4%	1471	3%	54	2%
Finance and business services	30617	9%	3701	7%	203	7%
General government	54858	17%	8994	17%	511	18%
Community personal services	47809	15%	8056	15%	375	13%
Industry employment total	324821	100%	52120	100%	2853	100%

(Quantec, 2016)

More often than not, small communities are vulnerable to external shocks as they lack a diverse economic base upon which to rely on. Within the Renosterberg LM, according to a municipal official, the small Petrusville town community relies heavily on agriculture and government services. This points to a relatively un-diversified economy, which was one of the challenges listed in the IDP. Developments such as the previously constructed Kalkbult Solar PV energy facility and the proposed Kloofsig Solar PV are therefore, seen as opportunities for expansion of the local economic base and subsequent employment creation which could assist in curbing the astonishingly high unemployment rate in the town. During the construction of such facilities, the local economy is boosted and many experience improved standards of living through direct and indirect work opportunities, however once construction is completed, residents are forced to return to their normal way of life.

3.6 Income

More often than not, the level of income determines several factors such as purchasing power, access to resources, and the overall standard of living. This means that the greater the disposable income per household, the greater the quality of life that can be enjoyed. Although income determines one's buying ability, in more cases than usual the amount of income earned per household or per person is linked to the type of employment, which is also guided by the level of education.

RENOSTERBERG LM



Figure 3-4: Renosterberg household income distribution

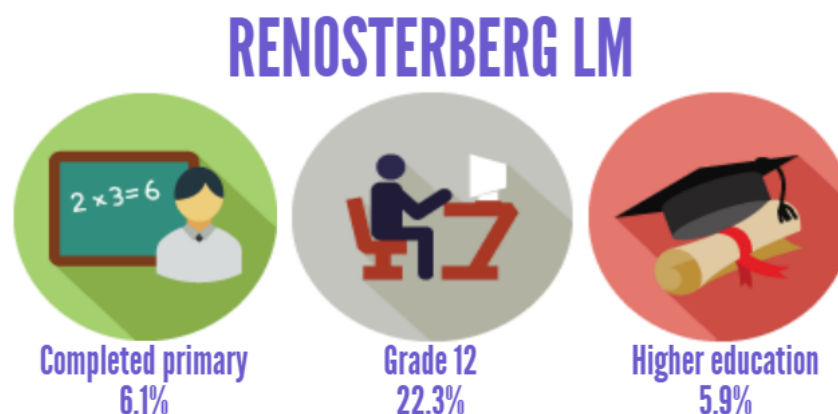
The average household income for the Renosterberg LM is R82 355 in 2016 prices; implying an average monthly income per household of R6 863. The monthly income for Petrusville town is R5 320; this figure is lower the monthly income at the district level (R7 381) as well as the Provincial level (R8 521) per month. As indicated in Table 3-6 below, in the year 2011; 10% of the Renosterberg LM did not receive any form of income. Within the LM, 64% of the people fell below the poverty line as they earn less than R3 200 per month.

Table 3-6: Household per monthly income groups (2011)

Indicator	Northern Cape	Pixley ka Seme DM	Renosterberg LM	Petrusville
No income	7%	8%	10%	12%
R1 - R3 200	52%	58%	64%	60%
R3 201 - R6 400	14%	13%	9%	10%
R6 401 - R12 800	13%	10%	7%	9%
R12 801 - R25 600	8%	6%	4%	4%
R25 601 - R51 200	2%	1%	1%	0%
>R51 200	5%	4%	5%	5%

(Stats SA, 2011)

With respect to the level of education in the Renosterberg LM, 15.3% of the total municipal population indicated that they did not have any form of education. Similar patterns are seen in Petrusville town as 15.2% also had no formal education during 2011 (Stats SA, 2011). As depicted in Figure 3-5 below, within the LM, 6.1% completed only primary school and only 22.3% passed matric showing staggering low levels of education achieved by the local residents. Furthermore, only 5.9% of the population indicated that they had continued to further their studies whilst Petrusville town has an even lower percentage of graduates (3.4%) (Stats SA, 2011). The high number of people without any education as well as the low post-matric qualifications in the Renosterberg LM is a major concern as it contributes to the high illiteracy in the municipality. The lack of skilled professionals as a result of a small tertiary educated pool, places constraints in the development of the municipality both in the short and long-term (Renosterberg IDP , 2015).

**Figure 3-5: Renosterberg LM Level of education**

According to interviews independently conducted with two interested and affected individuals, the current situation in Petrusville with regard to education as well as employment intake is intricately linked to the services as well as economic development of the area. This is so because the lack of a

diverse economy has resulted in limited job opportunities within the municipality. Furthermore, individuals who possess skills and could invest their time into developing the town choose to go and find work opportunities elsewhere as the local economy is not advanced enough and sufficiently sophisticated to absorb them. According to the interviewees, many of local secondary school graduates cannot afford university fees and fail to find decent employment. This has caused the youth of the area to resort to substance and alcohol abuse, and has resulted in an increase in crime levels within the small Petrusville community. The heavy influx of male migrant workers due to the introduction of developments such as the one under analysis is also often a cause for concern as it often negatively impacts young females (i.e. unwanted pregnancies and health-related diseases) who have completed their high school careers, further exacerbating social ills in the area.

3.7 Access to services and state of local built environment

Access to shelter, water, electricity, sanitation, and other services are indicators that assist to determine the standard of living of the people in the area under investigation. Infrastructure and the state of local infrastructure is another indicator to contemplate when considering living standards. The availability of social and economic infrastructure including roads, educational facilities, and health facilities further indicates the nature of the study area, which is valuable in developing a complete profile of the circumstances in which communities are living. These measurements create a baseline against, which the potential impacts of the proposed project can be Settlement profile

In comparison to the district's population density (1.80 people/km²), the Renosterberg LM is characterised by a slightly higher population density of 1.99 people/km². Importantly, almost half of the people living in the Renosterberg LM reside in Petrusville as indicated in Table 3-7 below.

Table 3-7: Population density of Pixley ka Seme DM

Indicator	Pixley ka Seme DM	Renosterberg LM	Petrusville
Population total	186 349	10 977	5 212
Area (Sq. Km)	103409.92	5527.15	58.60
Population density	1.80	1.99	88.95

(Stats SA, 2011)

3.7.1 Access to Housing and Basic Services

With respect to basic service provision and housing, the Pixey ka Seme DM is responsible for assisting, and ensuring, that local municipalities provide adequate housing to inhabitants within their jurisdiction. The current level of access to various basic services in the municipality are as follows:

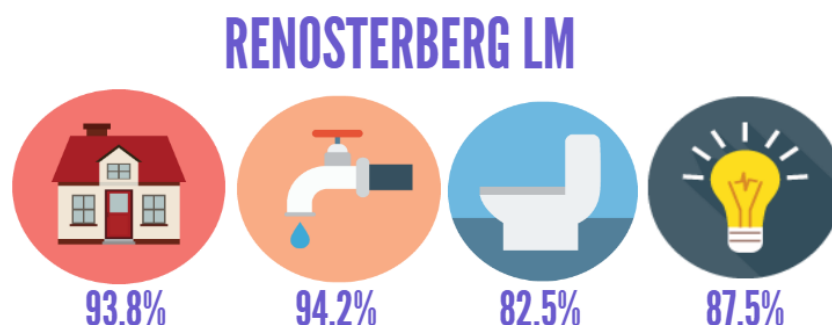


Figure 3-6: Renosterberg LM access to housing and basic services (Renosterberg IDP , 2015)

- **Housing:** Urban areas within the Renosterberg LM consist of various residential settings ranging from formal to informal dwellings (Renosterberg IDP , 2015). During the year 2011, 93.8% of the residents of the Renosterberg LM had access to formal housing (i.e., a house made of brick or a concrete structure on a separate yard). In Petrusville town, almost 90% of the residents lived in formal housing whilst the rest lived in informal settlements either in the backyard (1.3%) or a farm area (3.5%) (Stats SA, 2011). According to the 2015 municipal IDP, the LM has a housing backlog of 800 houses. Overall, formal housing dominates the housing sector, which gives the indication that the housing shortages within the LM is not as severe.
- **Access to piped water:** In the Renosterberg LM, 94.2% households have access to piped water, either inside their dwellings or yards. More than 75% of water is supplied by a local or regional water scheme operated by the municipality, whilst a few (15.6%) rely on water from boreholes. In Petrusville town, 92.1% of the people also have access to piped water either within their houses or yards. Over 90% of the water is supplied by a water scheme, whilst 3.7% is received from a dam (Stats SA, 2011). In the past, the municipality attempted a free-water supply programme to households that did not have access to water; however; in practical terms this proved to be difficult as it resulted in a loss (Renosterberg IDP , 2015).
- **Access to sanitation:** One of the requirements stipulated by the 2001 White Paper on Basic Household Sanitation is that each household must have its own toilet facility (Renosterberg IDP , 2015). In the Renosterberg LM, in the 2011 statistics show that 82.5% of the municipal population had access to flush toilets, either connected to the sewerage or a septic tank. Petrusville has a slighter higher percentage (85.4%) of people who fall under this category. Within the boundaries of both the LM as well as Petrusville town, there are a few individuals who rely on Pit latrines with or without ventilation at 8.3% and 6.7%, respectively (Stats SA, 2011).
- **Access to electricity:** According to the municipal IDP, electricity appears to be in good supply and is widely available across the whole municipality. In the LM, 87.5% of households have access to electricity, followed by Petrusville town which has 86.6% overall access to electricity. Candles are the second most used source of light for the LM (10.1%) as well as Petrusville town (11.5%).

3.7.2 Transport infrastructure

The transport sector plays a pivotal role in meeting the objectives of economic development. In the Renosterberg LM, the transport sector is characterised by a lack of availability in various modes of transport, storage facilities, and huge backlogs in telecommunication (Renosterberg IDP , 2015). The time and distance that residents take when travelling to work is not clear; however, most people in the Renosterberg LM travel to and from work by foot. Public taxis only operate in the morning when people are going to work and when they return to their respective homes in the afternoon (Renosterberg IDP , 2015). Bicycle use is also common however, most users complain that the needs of cyclists are not sufficiently catered for as there are no properly developed tracks. According to the Renosterberg LM IDP, the poor conditions of roads that connect rural areas to urban areas result in a lack of basic services provision to surrounding rural areas.

3.7.3 Social and Recreational Infrastructure

The **Renosterberg LM** has the following social and recreational infrastructure available: see Figure 3-7 below:



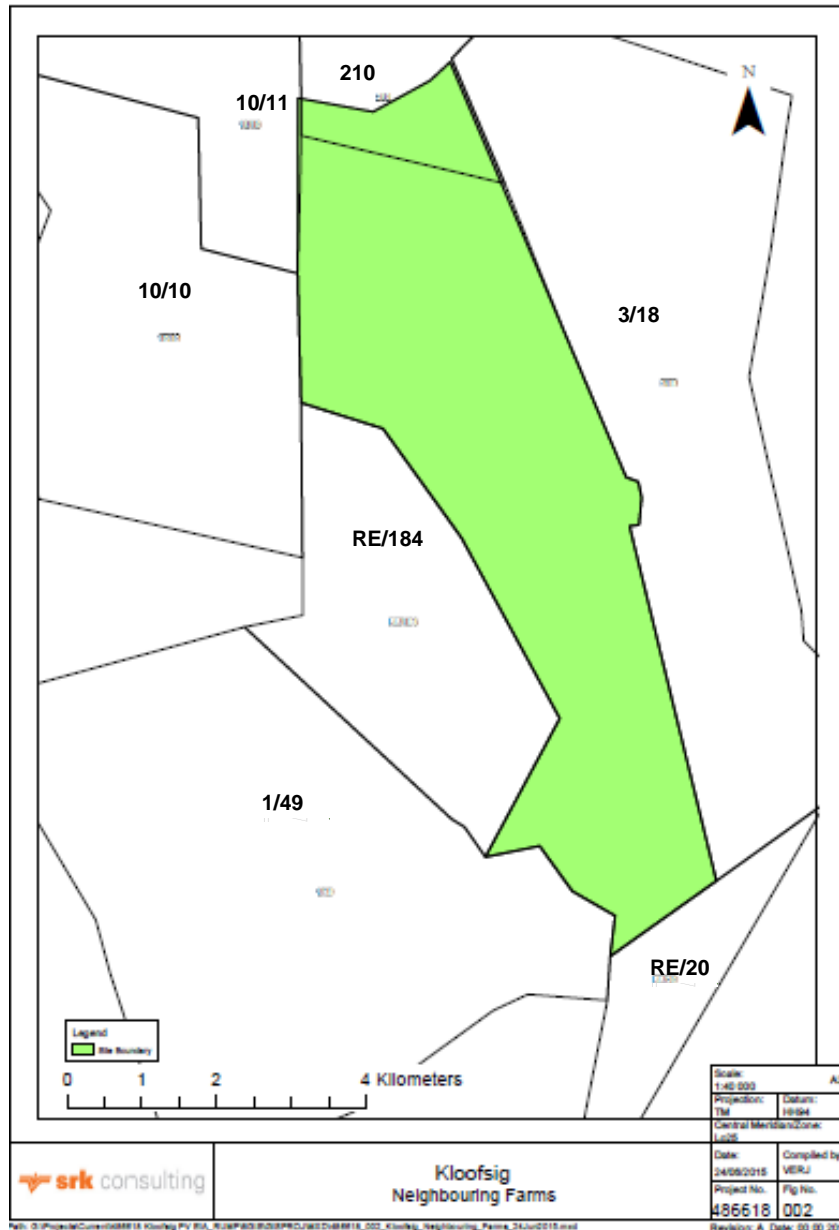
Figure 3-7: Renosterberg LM Social and recreational infrastructure (Renosterberg IDP , 2015)

- **Thirteen (13) schools:** (6 crèches, 5 primary and 2 secondary schools): Primary and secondary schools are found in Petrusville and Phillipstown. The vast distance and the lack of public transport is a major concern for access to Secondary schools. There are no buses to secondary schools and the taxi services are far too expensive (Renosterberg IDP , 2015).
- **Three (3) clinics:** The closest hospitals to this area within the Renosterberg LM are in De Aar as well as Hopetown. The three clinics available, which are located in each of the three major towns of Renosterburg therefore, serve as the only immediately available health facilities. The mobile clinics that once existed in Phillipstown and Petrusville have been terminated (Renosterberg IDP , 2015).
- **Three (3) police stations:** The safety and security of the nearby communities is catered for through the provision of three police stations. The head office is in Petrusville, which also hosts one of the satellite offices. Another satellite office is located in Phillipstown.
- **Four (4) libraries:** Although all four libraries are owned by the Renosterberg LM, most of the libraries located in the previously disadvantaged communities have limited resources.
- **Eight (8) cemeteries:** Five cemeteries are available in Petrusville and the other three are located in Phillipstown. Due to the geography of the area, Vanderkloof town utilises the almost full cemeteries in Petrusville town.
- **Seven (7) recreational facilities:** There is a lack of formal facilities within Petrusville and Phillipstown. Most of the available recreational facilities in the LM are found in Vanderkloof town. These facilities are managed by Eskom and are available for use to all community members (Renosterberg IDP , 2015).

4 SITE-RELATED INFORMATION

4.1.1 Land-use profile

The site that is earmarked for the development of the proposed Solar PV energy facility is shown on Map 4-1 below. The farm where the project is located and the farms adjacent to it are considered to be the potential **immediate zone of influence** as they are likely to be directly and indirectly affected by the proposed project as a result of various social and environmental effects.



Map 4-1: Potential zone of influence

Table 4-1 indicates the farm names and farm portions that comprise the immediate zone of influence.

Table 4-1: Directly and indirectly affected farm portions across the potential immediate zone of influence

Farm Portion	Farm Name	Farm no	Type
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00000	Kalkpoort	18	Directly affected-project site
00000	Nooitgedacht	210	Indirectly affected; adjacent to the project site
00010	Outaiboschpoort	10	
00000	Koppiesdam, Taaiboschpoort	184, 10	
00003	Kalkpoort	18	
00001 & 00000	Olienberg	20 & 49	

The following paragraphs describe the socio-economic profiles of each of the farm portions included in the potential immediate zone of influence. As indicated in Chapter 1, this information was sourced through telephonic interviews.

Portion 00000 of Kalkpoort Farm. No 18 (directly affected-project site)

- General information:
 - 2 600 hectares
 - Used for commercial farming which is the main source of income as well as Springbok hunting
 - The farm owners' family permanently live on the farm
 - Three permanent male workers and one female permanent worker (who live on farm with their families- six people in total)
- Concerns raised relating to the proposed development during telephonic interview:
 - Main concern is **dust** accumulating on the bushveld which is consumed by the sheep
 - Depending on the size of the project (Solar PV), the area allocated to sheep farming will potentially have to be reduced implying a loss for the farmer
 - Overall, farm owner sees the potential existence of the energy facility within the farm as a positive as they will be able to generate more income for the farm through solar energy
 - Landowner indicated that she would like to know when the project will be implemented

Portion 00000 of Nooitgedacht Farm No.210(indirectly affected, adjacent to project site)

- General information:
 - 2 100 hectares
 - 30 ha used for corn and wheat farming, the rest used for sheep, cattle as well as domestic game hunting (Springbok)
 - Farm employs seasonal workers i.e., during hunting season
- Concerns raised relating to the proposed development during telephonic interview:
 - Farm owner is not sure if the Solar PV facility will affect their hunting operations

Portion 00010 of Outaiboschpoort Farm No.10 (indirectly affected, adjacent to project site)

- General information:
 - 2 925 hectares
 - Used for commercial farming (dairy) which is the main source of income as well as private hunting of springbok
 - Two permanent workers living on the farm
- Concerns raised relating to the proposed development during telephonic interview:
 - None

Portion 00000 of Koppiesdam Farm No.184 and Taaiboshpoort Farm No.10 (indirectly affected, adjacent to project site)

- General information:
 - 3 300 hectares (adjoining farms)
 - Used for commercial farming, cattle and hunting
 - Main income is from farm rental (75%) and hunting (25%)
 - No one permanently lives on the farm. Workers employed by tenant live on the property for a day or two when coming to check fencing, general maintenance, and stock-related activities
- Concerns raised relating to the proposed development during telephonic interview:
 - The farm owner is very concerned about the **crime, stock-theft and loss of wild buck** due to the construction work taking place directly adjacent his property. This is especially concerning for him as there is no supervision on his farm.
 - The farmer raised concerns regarding the effect of the project on commercial activity and possible requirement for relocation of game.
 - Although the sheep can be relocated (at a cost), **additional losses** will be incurred from the disruption of the grazing rotation and field preservation programmes and having to find other grazing land
 - In the event that there is **damage to property**, the farm owner would also like to know who will be accountable for it as he has had terrible experiences in the past with project proponents who get lawyers involved and who are impossible to compete with
 - Although the owner does not live on the farm, he expressed his concern about the **visual impact** on the area as well as disturbances to the natural surroundings through both the construction and operational phases, especially since the Solar PV is directly adjacent to his game camp
 - Overall, the owner ended his concerns by adding that the proposed development is absolutely of **no benefit** to him and it will only **inconvenience** him.

Portion 00003 of Kalkpoort Farm No.18 (indirectly affected, adjacent to project site)

- General information:
 - 2 828 hectares
 - Used for commercial sheep and cattle farming as well as 15 oxen
 - Farm owner and his wife live on the farm as well as four workers. Families of the workers reside in Petrusville town.
- Concerns raised relating to the proposed development during telephonic interview:
 - **Stock theft:** is a major concern as the access road toward the Solar PV energy facility cuts straight across the Kalkpoort farm and there is no fence separating the road from the sheep that graze freely. Fencing will need to be put up along the road that crosses the farm to minimise disturbance to sheep.
 - The **dust** that will emerge as a result of construction vehicles will settle on the bossies and sheep will not be able to consume leaves covered by dust, the road needs to be sprayed so as to minimise dust formation.

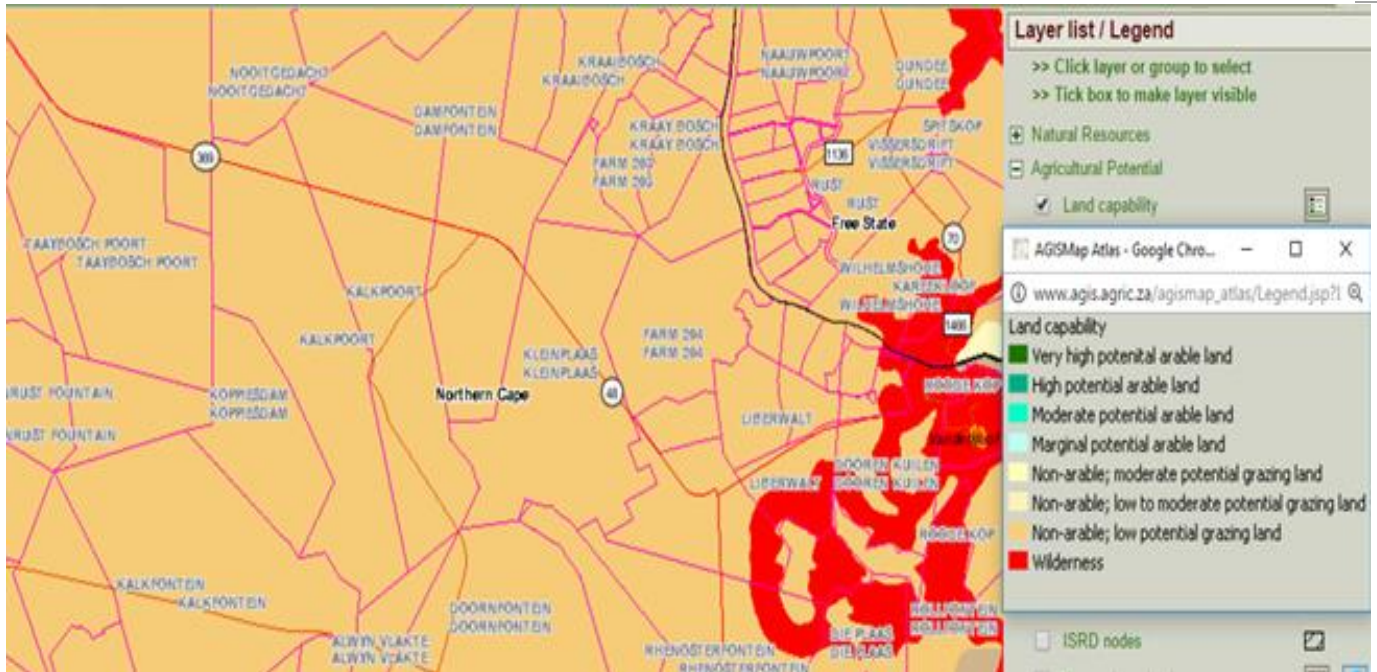
- Farmers need to be adequately compensated for the above-mentioned concerns and preventative measures must be taken.

Portions 00001 & 00000 of Olienberg Farm. No 20 & 49 (indirectly affected, adjacent to project site)

- General information:
 - 3 333 hectares
 - Used for commercial farming, which is the main source of income as well as commercial Springbok hunting to regulate their population
 - The farm owners' family occasionally lives on the farm
 - Two permanent workers who reside in Petrusville town
- Concerns raised relating to the proposed development during telephonic interview:
 - Farm owner expressed his great concern regarding safety and stock theft. There are currently fences which are meant to keep sheep within the property but these are not adequate to prevent crime or stock theft
 - The construction company is to ensure that crime and stock theft do not occur by implementing preventative measures as the farmer cannot do so without incurring additional costs
 - Farm owner expressed that if an additional road is to be built, he would have no concerns around that as he too would benefit; however, prior consultation would be mandatory
 - Concerns raised during operational phase:
 - At this point, the long-term impacts of the Solar PV energy facility are not clear. Thus, any unforeseen disruptive impacts on the farms operations would need to be adequately compensated
 - The farm owner also mentioned that he had a hope that the establishment of the Solar PV facility would have a positive impact on the local economy of Petrusville town as it is currently a town with very limited economic activity

4.1.2 Resources and land capability

The proposed study area is demarcated as agricultural land (see Map 4-2 below). Although the area is delineated for agricultural purposes, the land is also classified as non-arable land, which means that it is not suitable for arable farming such as the growing of crops. The potential study area on which the Kloofsig 1 Solar will be located also has a medium grazing potential as there is limited natural vegetation or resources found around the area. There is only one secondary catchment that passes through the site resulting in a lack of agricultural productivity in the area which has also led to a very low Gross Domestic Product per hectare contribution.



Map 4-2: Land capability of surrounding area (Agricultural Geo-References Information System, 2007)

4.1.3 Access to infrastructure

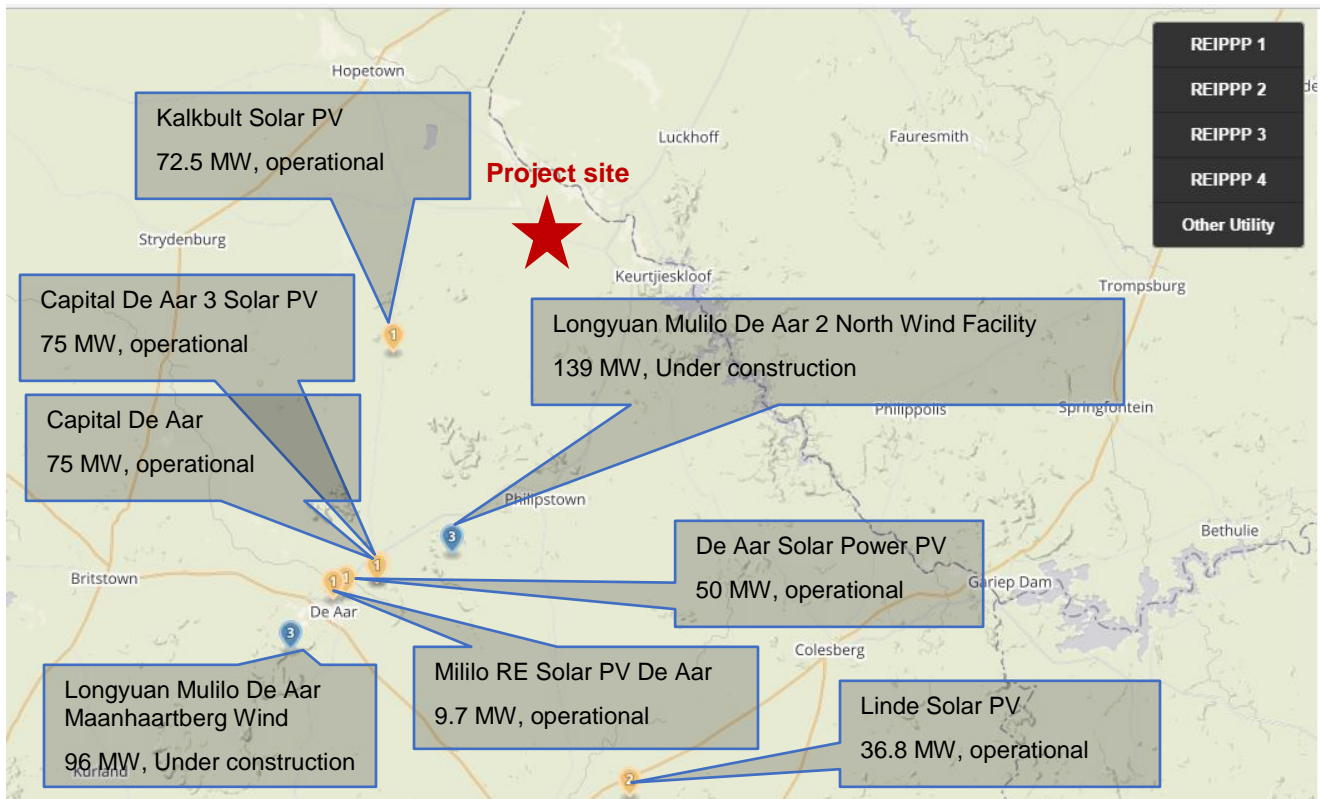
Apart from the R369 main road, which cuts across the north part of the proposed site, there is no other national or main road that traverses the area. According to the municipal manager, the current road infrastructure is still in a good condition and it is most likely not to be affected by the anticipated influx of jobseekers into the town.

The project site for the proposed Solar PV energy facility can be accessed through a narrow access road. The municipal official added that this road might need an upgrade as it is a small and narrow gravel road. Besides the proposed powerline, there are already two currently existing powerlines that cut across the site.

The electrical network of the Renosterberg LM is currently undergoing construction and the municipality has plans of developing their own 1.6 MW solar facility to improve on the service delivery of basic services such as electricity.

4.2 Existing and planned developments in the area

Depicted in Map 4-3 below, are some renewable projects that have already been approved under the RE IPPPP and are currently either under construction or already operational. Most of the projects are clustered around De Aar, whereas the proposed site will be developed outside Petrusville town, which is not in close proximity to any of the projects below. Kalkbult is the closest Solar PV energy facility to Petrusville town that has previously had an impact in creating temporary jobs for the Petrusville community during the construction phase. The above suggests that no cumulative impacts associated with the development of this and other renewable energy projects in the area can be expected at this stage.



Map 4-3: Depiction of approved for construction /or operational renewable energy projects in the area

5 IMPACT ANALYSIS

The following sections discuss the socio-economic impacts that the proposed project is envisaged to create, considering the knowledge of the potentially affected socio-economic environment, and the project components. The analysis of impacts is divided into the following groups:

- Impact on natural capital
- Impact on human capital
- Impact on social capital
- Impact on cultural and spiritual capital
- Impact on physical capital
- Impact on financial capital
- Impact on political and institutional capital

All potential impacts discussed in the section are scored per rating methodology provided by the Environmental Impact Assessment practitioner, which is available in Annexure A. The impacts are differentiated between those that would occur during construction and those that would ensue during operations.

5.1 Impact on natural capital

5.1.1 Impact associated with the loss of agricultural land

The land that is proposed for the development of the Kloofsig 1 Solar PV energy facility is used for sheep and cattle farming as well as game hunting. Should the proposed development commence as planned, the land affected by the project footprint will be sterilised from agricultural production, although two farm-owners have indicated the potential possibility of the relocation of the sheep within their farms or to adjacent farms with a limited effect on production in general.

In the worst-case scenario, the part of the farm where project will be located will no longer be possible to use for agricultural activities and specifically livestock farming and game hunting. However, the loss of the agricultural land, due to its current low grazing capacity and productivity in general, will not result in a noticeable reduction in agricultural production in the area. Since most of the renewable facilities are also developed further away from the site and are situated mainly in the Emthanjeni Local Municipality (i.e. around De Aar), the cumulative effect on agricultural production in the local municipality will be negligible.

Impact: Loss of agricultural production during construction and operations								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Local	Medium	Long-term	Medium	Definite	Medium	-	High
Management measures: Essential								
<ul style="list-style-type: none"> • The project developer should design the infrastructure layout in a manner that limits the footprint of the facility and all associated infrastructure; this should also be done in consultation with the land owner • If feasible, assist the owners of the farm with relocation of the sheep to nearby farms to ensure minimal loss in livestock production 								
After Management	Local	Low	Long-term	Low	Definite	Low	-	High

5.1.2 Impact associated with the disruption of commercial agricultural activities

In order to access the site during the construction phase, the construction vehicles and delivery vehicles will use the access road, which cuts across the Kalkpoort Farm No.210. Currently, the farm is used for sheep farming and there is no fence that separates the access road from the farm; thus, the sheep located on the farm move freely across the access road. The owner of the farm has raised a concern that this could pose a threat to his livestock; he also indicated his concern that the sheep will be disturbed by the noise from construction vehicles.

With respect to other adjacent farms, there is no evidence to suggest that the proposed project will create any disruptions to their commercial operations, as they will not be affected by the footprint of the project, nor the physical movement of vehicles; thus, all existing commercial operations on these farms are expected to continue.

Impact: Disruption of commercial agricultural activities during construction								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Local	Medium	Short-term	Very low	Probable	Very low	-	High
Management measures: Essential								
<ul style="list-style-type: none"> Put adequate measures to prevent the sheep from accessing the access road (i.e. fencing), as well as to ensure that the sheep could be moved over the road to other pastures, when required Consult with the farm owners located in the zone of influence and impose strict rules in terms of the movement of construction and delivery vehicles from and to the site along the access road (i.e. maximum speed limit, headlights, hours of movement, etc.) 								
After Management	Local	Low	Short-term	Very low	Probable	Very low	-	High

5.2 Impact on human capital

5.2.1 Impact on employment

The project proponent estimates that the **construction** phase period of the proposed Kloofsig 1 Solar PV energy facility will generate a total of 300 full time equivalent (FTE) person-years over the 12-18-month construction period. Of these, 58% of the jobs will be for skilled individuals and the remaining 42% employment opportunities will be occupied by unskilled individuals. Of the available work opportunities, about one out of five (57 FTE jobs or 19%) of the jobs will be made available to the local community, and specifically the towns of Petrusville, Vanderkloof and Phillipstown.

Considering the literacy levels of the Renosterberg LM, during the year 2011, only 22.3% of the total municipal population older than 20 years indicated that they had completed their matric qualifications, whilst 15.3% had no formal education. From this realisation, it is evidently sensible to argue that the employment opportunities for local labour that the proponent plans on availing will most probably fall within the unskilled portion of the total employment opportunities created. This is so because the lack of education and illiteracy levels within the Renosterberg LM makes it impossible to conclude that the local residents of the municipality will be able to provide the necessary skills required by the proponent. These opportunities will, however, be short-term as they will only last for the duration of the construction phase of the Kloofsig 1 Solar PV energy facility.

When the development reaches the **operational** phase, it is expected that 17 sustainable jobs will be created and sustained over the PV facility's operational period. Of these, 60% will be allocated to skilled individuals, whilst 40% will be for unskilled people. Similar to the construction phase, 19% of

these jobs will be made available to the local community comprising of Petrusville, Vanderkloof and Phillipstown.

Although the provision of employment to the local community is appealing, it is important to assess and understand the magnitude that the impact will have on the local community. Currently, the Renosterberg LM has a soaring unemployment rate of 27.7%, which equates to 1 001 of individuals who are in search for employment but cannot find any. Petrusville has an even higher unemployment rate (42.4%) and 655 unemployed individuals, suggesting that more than half of the unemployed people in the municipality reside in Petrusville. Considering the number of jobs that the proponent plans on creating and availing to local labour, the magnitude of the impact towards employment creation is that is envisaged to be created by the Kloofsig 1 Solar PV energy facility is therefore, most likely to be of a medium intensity during the construction and of low significance during operations. In the event that similar developments emerge within the same area, it can be expected that further employment opportunities will be made available for the rest of the local community.

Apart from the expected potential employment opportunities to be provided by the development of the project, the proponent also plans to assist in creating new and supporting the expansion of existing create Small, Medium and Micro Enterprises (SMME's) for the local community through local procurement. During the construction phase, local businesses within the security, catering and transport sectors could benefit indirectly; while during operations indirect opportunities for SMME's will be created within cleaning and security services. This means that there is a possibility to increase the magnitude of the impact of the development.

Impact: Temporary employment creation during construction								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Medium	Short-term	Low	Definite	Low	+	High
Management measures: Essential								
<ul style="list-style-type: none"> • Local labour should be employed as far as feasible to maximise the benefits to the local community. For that purpose, establish if a skills database exists within the local area, and: <ul style="list-style-type: none"> ○ If the database exists, it should be made available to contractors - information sharing will ensure that the proposed development is understood, enabling those individuals with fitting skills, if any, to make their services and/or knowledge available to the project proponent ○ If no database exists, set-up a skills desk at the local municipal office and in the nearby communities to identify skills available in the community, which will assist in recruiting local labour during both construction and operation. • Where feasible, training and skills development programmes targeted at the locals should be initiated prior to commencement of the construction phase • The recruitment process should promote gender equality. • Where possible and feasible, ensure that goods are procured from local businesses so as to increase chances of indirect job creation • Consultation with local authorities is essential so as to manage job creation expectations and ensure that all eligible workers in the primary study area are informed of the opportunities 								
After Management	Regional	Medium	Short-term	Low	Definite	Low	+	High

Impact: Sustainable employment creation through operation and maintenance activities								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Low	Long-Term	Medium	Probable	High	+	High
Management measures: Essential								
<ul style="list-style-type: none"> • Where possible, maximize the number of local labour employed for the jobs at the solar PV facility • Identify potential candidates from the local community to occupy permanent positions long before commencement of operations and, if necessary, send them for additional training 								
After	Regional	Low	Long-Term	Medium	Probable	High	+	High

Management								
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5.2.2 Impact on skills and knowledge

According to the proponents' estimations, 19% of employment opportunities will be for the benefit of the local community during both the construction and operational phases, which will require both skilled and unskilled labour. Based on the community's current literacy rate, it seems unlikely that the skilled labour will be sourced from the local economy.

It is therefore clear that during the **construction** phase, the local labour that will have been employed by the proponent will mainly benefit from a selection of certain **skills development** and on the job training. This is of benefit to any of the locally employed individuals as the skills acquired during the training cannot be lost and are irreversible and one is most likely not to forget what they have learnt. This will be of particular benefit in the event that similar Solar PV energy facilities cluster the Petrusville area in the near future as individuals will now have a higher chance of being appointed for the same construction-related opportunities.

Once the Kloofsig 1 Solar PV energy facility is **operational**, it is not yet evident what type of training the proponent will offer to the local community. The percentage of the annual revenue that will be allocated toward Social Development as well as Enterprise Development initiative is yet to be determined. Nonetheless, it is known that a certain amount of revenue will be allocated for skills development specifically targeting the local community and the towns of Petrusville, Vanderkloof and Phillipstown. Importantly, these skills development initiatives would be devised in consultation with the local authorities and communities, thus targeting the major areas of need and opportunities.

Impact: Skills development during construction								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Medium	Short-term	Low	Probable	Low	+	Medium
Management measures: Essential								
<ul style="list-style-type: none"> Where possible, local procurement of labour should be applied so as to ensure that benefits accrue to local community Contractors involved in the project should be encouraged to offer on-the-job training and share knowledge with the workers 								
After Management	Regional	Medium	Short-term	Low	Probable	Low	+	Medium

Impact: Skills development during operations								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Medium	Long-Term	High	Probable	High	+	High
Management measures: Essential								
<ul style="list-style-type: none"> Vocational skills transfer/training programmes should be developed and made available for the local labour Investigate the needs of the local community with respect to skills and address these through the skills development programme as part of the Enterprise Development and Social Development initiatives 								
After Management	Regional	Medium	Long-Term	High	Probable	High	+	High

5.2.3 Impact on health (and nutrition) of the community

During the **construction** phase, two of the farm-owners expressed concern regarding **dust formation** that will emerge as a result of the vegetation removal as well as the constant movement of the

construction and delivery vehicles to and from the project site. This is a short-term impact as it is expected to last for the duration of the construction phase, which is short-term ranging between 12 and 18 months. Importantly, considering the limited number of people who reside on the directly affected and adjacent farm portions and potential for mitigation of this impact using dust suppression methods, the significance of this impact from a human health perspective could be rated as low.

In the event that the development attracts an influx of migrant workers as well as jobseekers to the area, the potential increase in **sexually transmitted diseases, prostitution levels as well as xenophobic outbursts are likely to increase**. With this expectation, the presence of more people living and interacting within the local community increases the risk of a greater and faster spread of communicable diseases in the area.

In contrast to the above, it can also be argued that that improved living standards as a result of created employment opportunities as well as potentially stimulated purchasing power, might lead to an **improvement on peoples' nutrition levels**. According to the 2011 census, 10% of the residents of the Renosterberg LM did not earn any form of income, whilst 64% of them are forced to live on less than R3200 per month. Thus, with the introduction and possibility of higher income from the proposed development, residents are expected to enjoy a higher standard of living through increased access to improved nutrition. This, however, is only limited to individuals who will be employed during the development of the Solar PV energy facility and their beneficiaries.

Impact: Impact on health of the local town residents and residents of the directly and indirectly adjacent farms during construction								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Medium	Medium-Term	Medium	Probable	Medium	-	High
Management measures: Essential								
<ul style="list-style-type: none"> • Conduct awareness campaigns among construction workers and local community members (specifically targeting the youth and females) on health issues, including HIV/AIDS • Make condoms available to employees and all contracted workers for free • Developing a Code of Conduct for all employees related to the project, which includes no tolerance of activities such as alcohol and drug abuse • A Monitoring Forum (MF) should be created between the parties of interest who are directly and indirectly impacted by the project (i.e. farm owners, local councillors, project developers, local social workers, etc.) 								
After Management	Regional	Low	Medium-Term	Low	Probable	Low	-	High

5.3 Impact on social capital

5.3.1 Impact on social relations (i.e. social ills)

As previously mentioned, it is highly unlikely that the area will be able to provide the necessary skills required for the construction as well as operational phase of the Kloofsig 1 Solar PV. Thus, although some of the labour requirements will be sourced from the local community, jobs that mostly require skilled or semi-skilled individuals are likely to be granted to migrant workers. This has the potential to increase the population of the area as it will result in an influx of workers from outside communities or from the rest of the country.

It is envisaged that up to 243 migrant workers may be present in the area during some stages of the construction phase. Considering that the nearby towns of Petrusville, Vanderkloof and Phillipstown include 5 212, 1 226, and 3 356 residents, respectively, the potential migration of the above-

mentioned workers will be highly noticeable in these local communities. The project is also likely to attract job seekers from the nearby municipalities and possibly other parts of the province, which could make the change in the number of people staying in the area even more apparent for the residents of the respective towns.

In the likely event that most of the labourers choose to remain within the town after the **construction** is complete, in hope of available employment opportunities post-construction activities, the demographics of the area will be altered.

More often than not, a change in demographics that is influenced by the influx of male job seekers is associated with an increase in **social pathologies**:

- An influx of people from other parts of the country or potentially from outside of the country, may result in conflict between the locals and the migrants who are competing for the same job opportunity.
- Criminal activity can also increase as a result of people from outside the area who have failed to find employment for themselves forcing them to resort to unlawful activities.

Many of the above effects are difficult to avoid completely, but could be mitigated through engagement with the local communities and local authorities, proper sharing of information regarding the projects and opportunities available, as well as following strict labour sourcing channels and rules.

Impact: Increased social pathologies during construction								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	High	Medium-term	High	Probable	High	-	Medium
Management measures: Essential								
<ul style="list-style-type: none"> • Locals should be informed upfront about employment opportunities so that there are no unrealistic expectations on the part of the community • Ensure clear communication of the project information and effective public participation processes to minimise the possibility of an influx of migrant workers 								
After Management	Regional	Medium	Medium-term	Medium	Probable	Medium	-	Medium

5.3.2 Impact on personal safety, livestock safety and security

With regard to safety, the only mentioned possible issues by two farm owners is the likely possibility of **stock theft, crime, and attacks on personal property** due to an increase in the number of people present and moving around the area during the **construction** phase. If this happens, farming operations could be disturbed and farmers could incur losses. To ensure that this is not a common occurrence, the project proponent should carefully manage the expectation surrounding employment provision during both phases of the development, as well as instil strict access control measures. Prior engagement with the land owners in the area will also be required to ensure that the parties (the land owners and the developer) reach a mutually beneficial agreement with respect to the responsibilities and compensation policies if the above-mentioned risks transpire.

With the significantly high unemployment rate in the Renosterberg LM as well as Petrusville town, it is highly likely that the spread of the news around employment creation within the area and surrounding local communities will be quick, meaning that the chances of an influx of migrant workers to the area are highly probable.

In the likely event that some of the workers will remain in the region either in hope of receiving permanent employment during the 20-year operational life span of the solar facility or in search for other employment, the impact on safety is most likely to go beyond the construction phase. This will therefore, increase the possibility of its duration and overall risk for the local community.

Impact: Personal and livestock safety and security								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Medium	Medium-term	Medium	Possible	Low	-	Medium
Management measures: Essential								
<ul style="list-style-type: none"> • Ensure clear communication of the project information and effective public participation processes to minimise the possibility of an influx of migrant workers • Set up a strict access control system to the site and ensure that it prevents any chance of loitering by potential job seekers or other unauthorised people on the farm and adjacent farms • Manage the movement of workers/vehicles to and from the site and ensure that they are only on site during the reasonable working hours • Prior construction, rules and regulations regarding presence of construction workers on site need to be devised in consultation with the land owners of directly affected and adjacent properties • During construction, the rules and regulations must be clearly communicated to all workers and contractors, as well as penalties or consequences for not abiding by the rules; personal property must be respected • Any losses, personal or livestock related, incurred by the land owners of the direct affected or adjacent farms should be compensated if proven to be related to the project 								
After Management	Regional	Low	Short-term	Very Low	Improbable	Insignificant	-	Medium

5.4 Impact on cultural and spiritual capital

5.4.1 Change in sense of place

Effects on the cultural as well as social capital of an area is examined through the review of an altered sense of space and place. More often than not, the identity of an individual is linked to the space upon which one resides. The likely cause of this is often the shared and lived experiences attached to a particular familiar surroundings and environment. Therefore, a change in the environment has the potential to affect the wellbeing of an individual.

In the context of the proposed Kloofsig 1 Solar PV facility, the potential change in the sense of place and associated impact on cultural capital of the impacted individuals can be analysed on two levels:

- Landowners could potentially have a negative experience in the event that the area they use to identify their social and cultural capital is altered to an industrialised space ensued due to the changes in the landscape. Furthermore, the increase in traffic volumes on the local roads, noise associated with the movement and operation of construction vehicles, as well as the change in the landscape could negatively affect the sense of place experienced by the people living in the vicinity of the project site.
- There could also be a positive experience if the landowners view the presence of the energy facility within their area as a chance for stimulation of the local economy and alleviation of poverty levels in the community.

The farm owner of the Koppiesdam farm No.184 expressed his concern in relation to an altered sense of place as he feels the natural surroundings will be altered; thus, affecting the visual make-up of the area. Importantly, though, none of the other parties interviewed for this study expressed their concerns and rather viewed the facility from a positive perspective, which could create new jobs and stimulate

economic activities in the area. Therefore, from a general point of view, the development of one PV facility is not likely to change the perception of the larger community to a degree that it will have an impact on the cultural and spiritual capital of the community members. Having said this, appropriate mitigation measures will need to be put in place to minimise the visual effect of the facility on the surrounding land owners and visitors to the area.

Impact: Change in the sense of place during construction and operations								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Local	Low	Long-term	Low	Probable	Low	-	High
Management measures: Essential								
<ul style="list-style-type: none"> Adhere to mitigation measures suggested by various specialists such as noise, visual and air quality specialists to ensure that the magnitude of the impact is minimised 								
After Management	Local	Low	Long-term	Low	Probable	Low	-	High

5.5 Impact on physical capital

5.5.1 Impact on production

The project proponent estimates that the construction of the Kloofsig 1 Solar PV facility will require capital expenditure (CAPEX) of R1.5 billion in 2016 prices. The investment is required for the purchase of the goods, services, and labour needed as inputs to construct the Solar PV facility. It is also estimated that 50% of this CAPEX will be spent on procurement of goods within South Africa (possibly, solar PV panels assembled in South Africa and mounting structures manufactured locally).

The steps that need to be taken in an attempt to increase the benefit of **increased production** to the local community during the **construction phase** includes the commitment to maximise the use of the local labour, if possible, and make use of small local businesses that could provide goods and services required during the construction phase. However, considering that the local economic base is very small and is not sufficiently diversified, it should be acknowledged that such opportunities will be limited. At this point, the magnitude of the economic benefit that is expected to ensue in the local community is not certain; however, it is likely to be of a medium effect as it will only last for the duration of the construction phase (12-18 months).

The upkeep and maintenance of the Kloofsig 1 Solar PV facility will incur **operational** costs during the 20-year lifespan of the development. Although it would be highly beneficial to the local community, the current economic structure of the Renosterberg LM does not allow for the possibility of all the proponents' operational expenditure (OPEX) to be spent in the local economy. This is so because some of the maintenance activities implemented toward ensuring the operational functionality of the Solar PV might require goods and skills, which the LM is unlikely to be able to provide due to its limited economic base and skills pool to choose from. However, the local facility will be generating revenue, which will increase the size of the local economy and specifically its utilities sector; thus considerably altering the structure of the local economy.

Impact: Increased production during construction								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	National	High	Short-Term	High	Definite	High	+	High
Management measures:								

<ul style="list-style-type: none"> Where possible procure goods and services from the local SMMEs 								
After Management	National	High	Short-Term	High	Definite	High	+	High

Impact: Increased production during operations								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	High	Long-term	Very High	Definite	Very High	+	High
Management measures:								
<ul style="list-style-type: none"> Where possible procure goods and services from the local SMMEs 								
After Management	Regional	High	Long-term	Very High	Definite	Very High	+	High

5.5.2 Impact on road safety and infrastructure

The design and the layout of the infrastructure associated with the development of the Kloofsig 1 Solar PV includes an access road that connects from the R369 main route to the project site. It is unlikely that the landowners around the area will benefit from the proposed access road, and the Kalkpoort farm owner has raised concerns about dust and noise from construction and delivery vehicles as the road directly cuts across the farm. With the correct mitigation measures put in place such as the recommended fencing of the road as well as spraying of the road to minimise dust formation, the magnitude of the impact should be of a low effect.

An increase in traffic congestion associated with the construction of the PV facility on the R369 main route may potentially inconvenience other road users; however, this is most likely to be an interference during peak hours in the morning and the afternoon if there are people travelling to Petrusville town for work purposes via the R369 route. Also, once construction vehicles turn into the access road to the site, traffic (if any) will be alleviated.

Increase in traffic, especially considering the size and weight of the vehicles to be travelling to the site, is likely to **impact negatively on the road condition**. Without appropriate maintenance, the condition could further deteriorate. In order to prevent this from occurring, the project proponent will need to engage with the local municipality responsible for the road maintenance and come to an agreement with respect to the necessary support that may need to be provided to ensure that the road condition is not worsened as a result of the project development.

Impact: Deterioration of road conditions in the area and risk to road safety due to increase heavy vehicle movement in the area during construction								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Local	Medium	Medium-term	Low	Probable	Low	+	Medium
Management measures:								
<ul style="list-style-type: none"> Dust suppression measures must be implemented on site Appropriate signage must be put up for traffic control and road safety Engage with local municipality to discuss the potential impact on local road quality and the possible mitigation measures. 								
After Management	Local	Low	Medium-term	Very Low	Probable	Very Low	+	Medium

5.5.3 Impact on social facilities

The review of the recent district's as well as the municipal IDPs revealed that although Pixley ka Seme DM has four hospitals, none of these are located in the Renosterberg LM or the targeted communities (Petrusville, Vanderkloof and Phillipstown). The LM only has three functioning clinics, however numerous challenges bedevil these facilities resulting in an inadequate service to the community. Identified issues regarding health facilities within the LM include the shortage of medical staff, lack of AIDS support services, and the absence of a 24-hour emergency services (Renosterberg IDP , 2015).

With the expected influx of migrant workers and job seekers, considerable pressure will be placed on the regions' health care services. This means that in the event that the proponent fails to properly manage job expectation outcomes, government will need to act in accordance with the development needs in the provision of sufficient social infrastructure services such as personal healthcare. The impact however, should be short to medium-term as the influence of the influx is meant to last for the duration of the construction phase. In the likely event that workers will remain in the town in hope for employment during the operational phase, the duration of the impact may be prolonged but its significance is likely to decrease as many of the jobs seekers and migrant workers are likely to move away in search for other job opportunities. Provision of the dedicated health service by means of a mobile clinic at the site itself will also assist in mitigating the potential issue.

Impact: Increased demand for social facilities during construction as a result of in-migration of workers and job seekers								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Medium	Short-term	Low	Probable	Low	-	High
Management measures: Essential								
<ul style="list-style-type: none"> • Ensure effective communication of the project information throughout all stages to effectively manage expectations of local communities, local authorities and local land owners • Ongoing communication with the Local Municipality to ensure that they are aware of the potential demands that might arise from the development of the PV facility • Provision of a mobile clinic services to the workers 								
After Management	Regional	Low	Short-term	Very Low	Probable	Very low	-	High

5.5.4 Impact on basic service delivery

In the year 2008, the Renosterberg LM had a housing backlog of 800 households with the most backlogs concentrated in Phillipstown (Renosterberg IDP , 2015). Household backlog challenges that currently cripple the municipality are linked to problems around the lack of access to land, slow delivery of housing developments, lack of funding for housing development. The need for building and providing houses to the community increases the demand for land; in total, the Renosterberg LM needs as additional 16ha of land for new housing, of which about 5ha is required in Petrusville (Renosterberg IDP , 2015).

Should the proposed Kloofsig 1 Solar Power be approved, up to 300 construction workers will be residing in the nearby towns of Petrusville, Vanderkloof and Phillipstown, with the majority (up to 243) coming from outside these towns. The proponent will provide transportation between the project site and the towns where the workers will be accommodated, which will assist in exercising control over the movement of people on site and around it. However, it means that the demand for temporary accommodation as well as basic services during the **construction phase** will increase sharply in the nearby towns. The latter specifically refers to the demand for water and electricity provision, as well as

health and recreational facilities, as it is unlikely that the workers will move with their families thus no increase in the demand for early childhood development services and schools is envisaged. Without appropriate planning the increase in demand can negatively impact on the current service provision in the municipality, increasing the existing backlogs, as well as reducing the quality and availability of some of the services.

Attraction of potential job seekers, who are unlikely to find formal accommodation in the area and be able to pay for it may result in the formation of informal settlements in and around the neighbouring towns. Alternatively, residents within the towns may take advantage of the opportunity and utilise their backyards for renting purposes creating an informal hospitality industry. The presence of job seekers that were unable to find employment and adequate income source may also increase the pressure of police services in the area, as it could result in the alleviated rate of crime.

In order to mitigate this negative effect that could ensue during construction, engagement with the local councillors and local municipal authority (i.e. municipal manager, Local Economic Development officer, IDP officer, town planner, etc.), adequate information sharing regarding job opportunities during both construction and operation with the public and the local municipality, strict and transparent hiring practices, and assistance with the provision of selected municipal services (i.e. mobile clinic on site) may be implemented.

During **operations**, about 17 people will be employed on site to maintain and operate the facility with a few of these coming from the nearby towns. Due to the magnitude of the number of people that may need to permanently move to the area, it is unlikely to have any significant effect on the local community's service delivery and specifically the demand for health, educational and recreational facilities. However, the presence of migrant workers or jobs seekers, who may decide to stay in the area after construction is completed in hope to find employment during operations may prolong the issues experienced during construction.

Impact: Increased demand for basic service delivery during construction								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Medium	Short-term	Low	Probable	Low	-	Medium
Management measures: Essential								
<ul style="list-style-type: none"> Ensure effective communication of the project information throughout all stages of the development to ensure management of the expectations Ongoing communication with the Local Municipality to ensure that they are aware of the potential demands that might arise from the development of the PV facility Establish a health facility for the duration of the construction period to provide services to the construction crew and alleviate pressure on the local facilities 								
After Management	Regional	Low	Short-term	Very Low	Probable	Low	-	Medium

5.6 Impacts on financial capital

5.6.1 Impact on household income and financial resources

It is estimated that almost two thirds of the households in the Renosterberg LM as well as Petrusville town earn less than R3 200 per month.

During the **construction** as well as the **operational phase** of the project, the proponent has to take into consideration the labour costs that accompany the general maintenance and efficient functionality

of the Solar PV energy facility. Considering that the intended level of local labour procurement at this point is 19% of available positions, it is evident that the benefit to be accrued to the local community is limited. Specifically, assuming that each employment opportunity will benefit one household, about 57 local households will benefit from the project during construction and 3-4 local households will benefit from the project during operations. Nonetheless, households that have individuals who employed on site either during the construction or operational phase will experience an **increase in disposable income**. In addition, those households who benefit from indirect effects, i.e. procurement of catering, cleaning, and transportations services will also benefit financially. More often than not, an increase in income is accompanied by improved living standards.

Impact: Temporary increase in standard of living during construction due to growth of disposable income								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Medium	Short-term	Low	Probable	Low	+	Medium
Management measures: Essential								
<ul style="list-style-type: none"> Recruit local labour as far as possible to ensure that the benefits accrue to local households within the community Employ labour-intensive methods as far as possible in the construction phase Where possible, sub-contract to local companies 								
After Management	Regional	Medium	Short-term	Low	Probable	Low	+	Medium

Impact: Sustainable increase in standard of living during operations due to growth of disposable income								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Regional	Low	Long-term	Medium	Probable	Medium	+	Medium
Management measures: Essential								
<ul style="list-style-type: none"> Recruit local labour as far as possible to ensure that the benefits accrue to local households within the community Where possible, sub-contract to local companies 								
After Management	Regional	Low	Long-term	Medium	Probable	Medium	+	Medium

5.6.2 Impact on property values

Farms situated around the directly affected farm portion are mainly utilised for commercial sheep farming and game breeding purposes. During the interviews, none of the farm owners indicated that the presence of the Solar PV energy facility would affect their commercial agricultural activities. Furthermore, the presence of the project will not result in any land sterilisation of the directly adjacent farms and may only affect the land within the footprint of the project itself. This means that their main source of income (commercial farming) will not be sensitive to the development of the proposed project, and the latter will not have a direct negative effect on the surrounding farming operations. There were however, concerns related to dust pollution, stock theft, and personal safety, which are all considered to be a possibility and which will need to be taken seriously by the project proponent.

More often than not, renewable energy developments such as this one could have one or two primary impacts on property values:

- Land value could be reduced based on real or perceived adverse effects of the proposed development such as noise levels, traffic, and aesthetics, or
- The demand for surrounding properties and temporary accommodation could increase, leading to a rise in the areas property value.

Considering the fact that the directly and indirectly affected farms will continue with their current commercial agriculture activities, it is reasonable to assume that the values of indirectly and directly affected farms will remain unaffected by the project. The demand for affordable accommodation, though could increase the property prices in the nearby towns, which has been observed in areas such as Postmasburg, De Aar, and Prieska. However, this will likely only happen in the event that other similar developments in the area are approved, raising the demand for residential and commercial property.

Impact: Impact on property values during construction and operations								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	Local	Medium	Short-Term	Very low	Possible	Insignificant	-	Medium
Management measures:								
<ul style="list-style-type: none"> Ensure that other specialists' recommendations regarding mitigations of noise, dust pollution and visual effects are implemented Employ as many local labour as possible to curb the increase in demand for temporary accommodation and limit the growth in property prices 								
After Management	Local	Low	Short-Term	Very low	Possible	Insignificant	-	Medium

5.7 Impacts on political and institutional capital

5.7.1 Impact on government ability to service community

Currently, the Renosterberg LM is experiencing several backlogs related to the housing as well as basic services such as sanitation, social, and recreational infrastructure as well as water backlogs. To address the sanitation backlog in particular, all local municipalities within the Pixley ka Seme DM are implementing sanitation projects (Renosterberg IDP , 2015).

Should the proposed Kloofsig 1 Solar PV energy facility development receive authorisation, the PV facility will **generate revenue for the government**. This will either be in the form of tax-related revenue collected by national government (i.e. VAT, payroll, and income taxes) and tax- and rates-related revenue collected by local government (i.e. property rates, services rates, etc.).

Revenue collected by local government will be of benefit to local communities and the LM as a whole as the revenue is often invested in the upliftment of local municipalities which can result in an improvement in service delivery. Taking into consideration the fact that revenue collected will occur for the whole duration (**construction and operational**) of the project, the impact of the collected revenue is most likely to have a long-term effect.

Impact: Increased tax revenue for government during construction and potential ability to deliver services better								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence
Before Management	National	Medium	Short-term	Medium	Definite	Medium	+	High
Management measures:								
<ul style="list-style-type: none"> No mitigation measures exist 								
After Management	National	Medium	Short-term	Medium	Definite	Medium	+	High

Impact: Increased tax revenue for government during operations and potential ability to deliver services better								
	Spatial Extent	Intensity	Duration	Consequence	Probability	Significance	+-	Confidence

Before Management	National	Medium	Long-term	Very-high	Definite	Very high	+	High
Management measures:								
• No mitigation measures exist								
After Management	National	Medium	Long-term	Very-high	Definite	Very high	+	High

6 NEEDS AND DESIRABILITY FROM A LOCATIONAL PERSPECTIVE

The following table outlines the need and desirability of the proposed project from a locational perspective. It informs the justification of the project to be built at the proposed time and location from a socio-economic perspective.

Table 6-1: Needs and desirability from a local perspective

Aspect	Comment
Creation of residential and employment opportunities in close proximity to or integrated with each other	The proposed Kloofsig 1 Solar PV energy facility will create a number of jobs during construction and a few jobs during operations that will benefit the communities of Petrusville, Vanderkloof and Phillipstown, that have relatively high unemployment rates.
Reduced need for transport of people and goods	The project will create new employment opportunities that will be of benefit to both local community members as well as migrant workers. Due to the currently high unemployment levels in the town and LM, new employment opportunities may possibly reduce the need of some members of the local community to commute long distances for work or in search of jobs.
Access to public transport or enable non-motorised and pedestrian transport	Since workers employed at the site during both construction and operation will reside in the nearby towns, the project proponent will provide necessary transportation during the construction phase.
Complimenting other uses in the area	The predominant land use in the area is currently commercial agriculture. The proposed Kloofsig 1 Solar PV is the second to be potentially built in the area not far from the towns of Phillipstown and Petrusville (after Kalkbult Solar PV facility) and in terms of the land capability assessment of the project site, it is not an area that has a high agricultural potential. If properly managed, the change in the land use should not be viewed as significant. Although the project may change the sense of place, solar PV facilities are not perceived as hazardous or as a heavy/dirty industry. Numerous similar facilities have been constructed and are fully operational around De Aar within the same district; therefore, there is empirical evidence that such facilities can co-exist with commercial livestock farming activities.
Alignment with planning for the area	An assessment of the key policy documents revealed that all spheres of government (national, provincial, and local) are in support of the establishment of renewable energy projects at the envisaged location. Therefore, from a policy perspective, no red flags were identified that could raise concern over the project's development.
Use of underutilised land available (only for urban related development)	N/A
Optimisation of the use of existing resources and infrastructure	The resource base and potential of the land where the project is envisaged to be developed is considered to be limited. It is not suitable for crop farming and can therefore only be used for livestock farming. The proposed project will derive a far greater turnover from the land than the current land uses, thus suggesting that it is a more optimal utilisation

Aspect	Comment
	of existing land.
Discouragement of "urban sprawl" and contribute to compaction/densification	The project is not envisaged to have any direct effect on urban sprawl especially due to the fact that construction workers will be residing in the nearest towns. The likely and expected occurrence is that employed individuals with specialised skills from others areas will relocate to the towns close to the project site.
Contribution to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current need	The proposed development will assist in bringing employment opportunities closer to the communities who were previously more removed from economic opportunities.
Encouragement of environmentally sustainable land development practices and processes	The proposed project is in line with the advancement of RE initiatives in the country. However, in the event that similar projects are clustered within the same area, care should be taken to ensure that food security is not adversely affected by loss of productive agricultural land.
Consideration of special locational factors that might favour the specific location	The Northern Cape Province's climatic conditions render the region to be considered as ideal for the development of Solar PV energy facilities.
Generation of the highest socio-economic returns	In comparison to the current socio-economic returns derived from the land, the proposed development is most likely to provide more opportunities to nearby communities. It will also generate a higher income for the national as well as local economy, than the current activities on the directly affected farm portion.
Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area	Currently, farms are not providing the same economic opportunities as they did in the past. The Petrusville community is crippled by a high unemployment rate and instances of substance abuse. The likely possibility of the proximity of the project in the area is that the local community will view the change in land use as a result of the proposed project development as positive since it will benefit them in terms of greater employment opportunities and stimulation of SMMEs.
Promotion or contributing to create a more integrated settlement	The employment opportunities that will be created by the proposed Kloofsig development will reduce the chances of people searching for employment opportunities elsewhere. Furthermore, the project is likely to contribute to the wellbeing of the local community through Socio-Economic Development and Enterprise Development contributions during its operation. This will improve the living standards of the local communities as it will increase their access to basic services that could aid in creating a more integrated community.

7 CONCLUSION

Kloofsig Solar (Pty) Ltd proposes the development of the Kloofsig 1 Solar PV energy facility near Petrusville in the Northern Cape Province. It is intended that the PV facility, with a 75 MW export capacity and its associated infrastructure, will be established on the remaining extent (Portion 0) of Farm Kalkpoort No.18.

The review of applicable and key policy documents revealed that all spheres of government are in support of the establishment of the proposed project at the envisaged location. From a policy perspective, no red flags could be identified that would impact the project; one such example is the alignment of the district plan of diversifying the local economy through advanced industries such as the RE sector. Although this is the case, care should also be taken in ensuring that the establishment and growth of the present development as well as future developments ought not to significantly negatively affect the simultaneous growth of other activities identified as drivers of economic development in the study area, such as tourism and agriculture.

The local community of Petrusville and the Renosterberg LM is crippled by a number of socio-economic related challenges. At the forefront of them all is the unprecedented high unemployment levels and limited economic opportunities due to a small economic base and limited resources. The proposed project will assist in addressing these challenges and improve the current socio-economic situation in the municipality and especially in the nearby towns of Petrusville, Vanderkloof and Phillipstown, which will be the targeted communities for the project in terms of job creation and SED and ED spend. It will employ up to 300 people during construction, of which around 57 employment positions will be made available to the local labour, and will provide employment opportunities for about 17 people during operations. The project will also increase the economic base of the local municipality and contribute towards government revenue, as well as improved standard of living of the local households.

The majority of the farm portions surrounding the project site are currently being used for sheep farming and game hunting. The proposed development will not affect any of these operations; the directly affected property owners also indicated that they have the option of relocating their livestock to nearby farms during construction; however, such relocation, if required will need to be properly compensated by the project proponent. Dust pollution, noise, change in the sense of place, and potential theft of personal property and livestock are some of the major concerns that were raised by the directly and indirectly affected farm owners. These issues though can be mitigated.

The following table summarises all the positive and negative socio-economic impacts identified to be associated with the proposed project during construction and operations.

Table 7-1: Post mitigation impact significant ratings

Impact	Type	Phase	Before mitigations	After mitigations
Loss of agricultural production	Negative	Construction and operations	Medium	Low
Disruption of commercial agricultural activities		Construction	Very low	Very low
Temporary employment creation	Positive	Construction	Low	Low
Sustainable employment creation	Positive	Operations	High	High
Skills Development	Positive	Construction	Low	Low
Skills Development	Positive	Operations	High	High
Impact on health of the local town residents and residents of the directly and indirectly adjacent	Negative	Construction	Medium	Low

Impact	Type	Phase	Before mitigations	After mitigations
farms during construction				
Increased social pathologies	Negative	Construction	High	Medium
Personal and livestock safety and security	Negative	Construction	Low	Insignificant
Change in the sense of place	Negative	Construction and operations	Low	Low
Increased production	Positive	Construction	High	High
Increased production	Positive	Operations	Very high	Very high
Deterioration of road conditions in the area and risk to road safety due to increase heavy vehicle movement in the	Negative	Construction	Low	Very low
Increased demand for social facilities during construction as a result of in-migration of workers and job seekers	Negative	Construction	Low	Very low
Increased demand for basic service delivery	Negative	Construction	Low	Low
Temporary increase in standard of living of households due to growth of disposable income	Positive	Construction	Low	Low
Sustainable increase in standard of living of households due to growth of disposable income	Positive	Construction	Medium	Medium
Impact on property values during	Negative	Construction and operations	Insignificant	Insignificant
Increased tax revenue for government and potential ability to deliver services better	Positive	Construction	Medium	Medium
Increased tax revenue for government and potential ability to deliver services better	Positive	Operations	Very high	Very high

Overall, it is clear that positive impacts to ensue from the project during construction and operations outweigh the negative effects. Furthermore, based on the needs and desirability assessment from a local perspective, it can be deduced that the project will generate positive socio-economic returns for the local economy and its community, and should therefore, be considered for implementation.

ANNEXURE A: IMPACT RATING CRITERIA AND METHODOLOGY

The assessment of impacts will be based on the professional judgement of specialists at SRK Consulting, fieldwork, and desk-top analysis. The significance of potential impacts that may result from the proposed development will be determined in order to assist DEA in making a decision.

Table A-1: Criteria used to determine the Consequence of the Impact

Rating	Definition of Rating	Score
A. Extent– the area over which the impact will be experienced		
None		0
Local	Confined to project or study area or part thereof (e.g. site)	1
Regional	The region, which may be defined in various ways, e.g. cadastral, catchment, topographic	2
(Inter) national	Nationally or beyond	3
B. Intensity– the magnitude of the impact in relation to the sensitivity of the receiving environment		
None		0
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
C. Duration– the time frame for which the impact will be experienced		
None		0
Short-term	Up to 2 years	1
Medium-term	2 to 15 years	2
Long-term	More than 15 years	3

The combined score of these three criteria corresponds to a Consequence Rating, as follows

Table A-2: Method used to determine the Consequence Score

Combined Score (A+B+C)	0 – 2	3 – 4	5	6	7	8 – 9
Consequence Rating	Not significant	Very low	Low	Medium	High	Very high

Once the consequence has been derived, the probability of the impact occurring will be considered using the probability classifications presented in Table A-3.

Table A-3: Probability Classification

Probability– the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

The overall significance of impacts will be determined by considering consequence and probability using the rating system prescribed in the table below.

Table A-4: Impact Significance Ratings

Significance Rating	Possible Impact Combinations		
	Consequence		Probability
Insignificant	Very Low	&	Improbable
	Very Low	&	Possible
Very Low	Very Low	&	Probable
	Very Low	&	Definite
	Low	&	Improbable
	Low	&	Possible
Low	Low	&	Probable
	Low	&	Definite
	Medium	&	Improbable
	Medium	&	Possible
Medium	Medium	&	Probable
	Medium	&	Definite
	High	&	Improbable
	High	&	Possible

Significance Rating	Possible Impact Combinations		
	Consequence		Probability
High	High	&	Probable
	High	&	Definite
	Very High	&	Improbable
	Very High	&	Possible
Very High	Very High	&	Probable
	Very High	&	Definite

Finally, the impacts will also be considered in terms of their status (positive or negative impact) and the confidence in the ascribed impact significance rating. The system for considering impact status and confidence (in assessment) is laid out in the table below.

Table A-5: Impact status and confidence classification

Status of impact	
Indication whether the impact is adverse (negative) or beneficial (positive).	+ ve (positive – a 'benefit')
	– ve (negative – a 'cost')
Confidence of assessment	
The degree of confidence in predictions based on available information, SRK's judgment and/or specialist knowledge.	Low
	Medium
	High

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **Insignificant:** the potential impact is negligible and will not have an influence on the decision regarding the proposed activity/development.
- **Very Low:** the potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity/development.
- **Low:** the potential impact may not have any meaningful influence on the decision regarding the proposed activity/development.
- **Medium:** the potential impact should influence the decision regarding the proposed activity/development.
- **High:** the potential impact will affect the decision regarding the proposed activity/development.

- **Very High:** The proposed activity should only be approved under special circumstances.

Practicable mitigation measures will be recommended, and impacts will be rated in the prescribed way both with and without the assumed effective implementation of mitigation measures. Mitigation measures will be classified as either:

- **Essential:** must be implemented and are non-negotiable; or
- **Optional:** must be shown to have been considered, and sound reasons provided by the proponent, if not implemented.

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