



SOCIAL IMPACT ASSESSEMENT

PROPOSED DEVELOPMENT OF A 110 MW SOLAR PHOTOVOLTAIC (PV) FACILITY ON PORTION 9 OF THE FARM COMMANDANTS PAN NO. 382, FARM TAFEL BAAI NO. 413 AND PORTION 12 OF THE FARM NOOIT GEDACHT NO.74, KHAUTA SOUTH SOLAR PV FACILITY, NEAR RIEBEECKSTAD, MATJHABENG LOCAL MUNICIPALITY, FREE STATE PROVINCE.

December 2022

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QUALITY AND REVISION RECORD

QUALITY APPROVAL

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This report has been prepared in accordance with Enviroworks Quality Management System.

REVISION RECORD

Revision Number	Objective	Change	Date
1	Draft Report	Internal review <ul style="list-style-type: none"> - Discussion of alternatives, - Need and Desirability, - Cumulative Impacts, - Mitigation measures, - Formatting and layout, - Grammar. 	23/11/2022
2	Client Review	<ul style="list-style-type: none"> - Visual impact mitigation measures. - Power line alternatives. 	15/02/2023

DISCLAIMER

Even though every care is taken to ensure the accuracy of this report, environmental assessment studies are limited in scope, time and budget. Discussions are to some extent made on reasonable and informed assumptions built on bona fide information sources, as well as deductive reasoning. Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage during the impact assessment phase. The author does not accept responsibility for conclusions made in good faith based on own databases or on the information provided. Although the author exercised due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, directly or indirectly by the authors and by the use of this document. This report should therefore be viewed and acted upon with these limitations in mind.

EXECUTIVE SUMMARY

INTRODUCTION

Enviroworks was appointed by WKN Wind Current SA (Pty) Ltd, to undertake a Social Impact Assessment (SIA) for the proposed development of the 110 Megawatt (MW) Khauta South Solar Photovoltaic (PV) Facility RF (Pty) Ltd, north-east of Riebeeckstad, Free State Province.

This SIA will form part of the Environmental Impact Assessment (EIA) process conducted by Enviroworks. The information contained within this report was sourced from:

- The Scoping Report compiled by Enviroworks,
- Comments received by Enviroworks from Organs of State and Interested & Affected Parties during the Public Participation Process,
- Relevant policy and planning documents:
 - The National Development Plan (2030),
 - Department of Environmental Affairs & Development Planning: Guideline for Involving Social Assessment Specialists in EIA Processes (2007),
 - White Paper on Renewable Energy - November 2003 (Department of Minerals and Energy),
 - Free State Provincial Spatial Development Plan 2014,
 - Lejweleputswa District Municipality: Integrated Development Plan 2017-2022,
 - Matjhabeng Local Municipality: Integrated Development Plan for The Financial Year 2017 – 2022,
 - Frank Vanclay: International Principles for Social Impact Assessment (2003),
- Consultation with Interested & Affected Parties (I&APs) - Identification of I&APs was done by:
 - Consulting landowners within the proposed development footprint;
 - Identifying and consulting with surrounding landowners;
 - Notification and/or consultation with various Organs of State (a list of departments notified and/or consulted can be found in Appendix 3; and,
 - Publishing an advert in a local newspaper to notify potential I&APs of the project and the opportunity to comment.
- Review of similar developments in the area.

The proposed 110 MW Khauta South Solar PV Facility will cover an area of approximately 168ha and will result in social impacts during its Construction, Operation and Decommissioning Phases. To ascertain the potential impacts on the surrounding communities, a SIA study was commissioned. The proposed facility forms part of a proposed solar photovoltaic (SPV) cluster, which includes three other similar solar PV developments in close proximity. This creates a potential for cumulative social impacts (See **Table 4**).

This SIA aims to determine and assess the social impacts associated with the proposed solar facility development as well as to provide measures to increase positive impacts and mitigate negative impacts.

LOCATION AND PROJECT DESCRIPTION

The Khauta South SPV Facility and associated infrastructure are proposed to be located on Portion 9 of the Farm Commandants Pan No. 382, Tafel Baai Farm No. 413 and Portion 12 of the Farm Nooitgedacht No. 74, approximately 3.5km north-east of Riebeeckstad, within the Matjhabeng Local Municipality in the Free State Province. More information on the boundaries of the proposed development can be obtained in Section 1.7 of this report. The facility is envisaged to have a maximum export capacity of 110 MW power, to be achieved through several arrays of PV panels and the following associated infrastructure:

- PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures;
- Associated stormwater management infrastructure;
- Battery Energy Storage System (BESS);
- Site- and internal access roads (up to 6 m wide);
- Auxiliary buildings (offices, parking, etc.);
- Ablution facilities and associated infrastructure;
- Temporary laydown area during the construction phase (which will be a permanent laydown area for the BESS during the operational phase);
- On-site 33/132 kV substation (facility substation) and associated 33/132 kV collector transmission line;
- Grid connection infrastructure including medium-voltage cabling between the project components and the facility substation (underground cabling will be used where practical);
- Perimeter fencing; and,
- Rainwater and/or groundwater storage tanks and associated water transfer infrastructure.

ALTERNATIVES

Possible alternatives that could be considered include:

1. Site Alternatives;
2. Layout Alternatives;
3. Technology alternatives for the solar panels – fixed/mounted PV panels or tracking PV panels (solar panels that rotate to follow the sun's movement/trajectory);
4. Technology alternatives for the battery energy storage system (BESS) – solid state batteries or redox flow batteries; and,
5. The No-Go option

Various alternatives have been considered leading up to and during the Scoping Phase and in the Scoping Report. The alternatives considered and the outcomes are detailed in the Scoping Report. Various layouts were considered in the initial Scoping Phase, particularly taking into account sensitive environmental areas, and a recommended layout was provided for further assessment in the Social Impact Assessment. Of note, are visual impacts, which can vary based on the technology type and design used. As assessing visual impacts is outside of the expertise of the Specialist and considering that a Visual Impact Assessment has been conducted as part of the EIA process, the different design and technology types have not been assessed in this report. It has rather been recommended that the alternative with the lowest visual impact be used, as per the findings of the Visual Impact Assessment.

Based on the consideration of various alternatives during ~~the during~~ the Scoping Phase, only a preferred layout and technology type were provided to be assessed by the Social Specialist, and thus only the Preferred Alternative and the No-Go Alternative have been assessed in this report.

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NEED FOR THE PROJECT

The overall need for alternative energy resources ('green energy') is driven by the known environmental impacts associated with coal power generation, through which most of South Africa's electricity is currently being generated. These impacts include greenhouse gases, other air pollution, water use, and carbon tax, making 'green energy' a more favourable alternative for meeting the growing need for electricity.

The commercial feasibility for the proposed 110 MW Khauta South SPV Facility has been informed by its contextual location, and economic, social, and environmental impacts and influence.

Power generation is one of the rare growth opportunities for the Free State Province due to the high solar irradiation levels experienced in the province and the strategic location in terms of the Strategic Transmission Corridors (Central Corridor) compiled in terms of section 24(3) of National Environmental Management Act, 1998. This setup creates growth opportunities for the area, and the establishment of a renewable energy project is considered important to diversify and complement the economic development of the region.

The benefits of renewable energy facilities to local regions are not confined to the initial investment in the project. They also provide a reliable and on-going income for landowners and municipality, creating direct employment opportunities for locals, as well as flow-on employment for local businesses through provision of products and services to the project and its employees.

During the estimated 18-month Construction Phase, job opportunities will involve about 5 000 man-months, or approximately 333 full time contract jobs during construction. Approximately 15-20 full time jobs will be created during the Operational Phase. As there is limited local skilled labour in the field of renewable energy, the employment structure will likely consist of local and outside capacity. Khauta South SPV Facility will likely use the skills of outside labour to cross-train local specialists. This cross training and skills development will take place especially in technical maintenance and administration.

SUMMARY OF KEY FINDINGS

POLICY AND PLANNING FINDINGS

A brief summary of the key documents, reviewed in Section 2 "Policy and Planning Environment", is provided below, to explain the main aims of the different Policy documents reviewed during this study.

The National Development Plan (NDP) (2011) contains a plan aimed at eliminating poverty and reducing inequality by 2030 making this one of the guiding objectives of the NDP over the next 20 years. The proposed development will create new jobs, aligning with the NDP job creation objective and is anticipated to have a greater overall positive impact on the local economy, than the No-Go Option as found by the Economic Impact Assessment done for the proposed solar facility (van Jaarsveld, 2022) . The proposed development aligns with the White Paper on Renewable Energy

which supports the development of South Africa's renewable energy sector in order to reduce greenhouse gas emissions.

The aims in the Free State Provincial Spatial Development Framework (PSDF) of implementing a 'developmental state' while ensuring global obligations to social, economic and environmental sustainability are achieved, have been considered and the proposed solar farm does not compromise these.

The Lejweleputswa District Municipality: Integrated Development Plan 2017-2022 identifies the development of solar power plant as a strategic objective and the solar energy hub for the southwestern part of the district has been identified for a potential solar energy hub. The district has seen retrenchments in the mining industry.

It is noted in the Local Municipality: Integrated Development Plan for The Financial Year 2017 – 2022 that the Matjhabeng area has a well-established bulk electrical network, although the electrical infrastructure is aging. The Local Municipality is endeavoring to reduce their carbon footprint and move towards a green economy.

KEY IMPACT FINDINGS AND RECOMMENDATIONS OF THE CONSTRUCTION, OPERATIONAL AND DECOMMISSIONING PHASES

Construction Phase

The most significant social issues associated with the construction phase include:

Potential Positive Impacts

- **Positive economic impacts – job creation and knock-on effects.**

The Construction Phase will create new employment opportunities for unskilled (limited), semi-skilled and skilled positions. These will have a direct benefit for persons being employed. The Applicant, contractors and employees will spend money on local goods and services, which will have positive economic knock-on effects for the local businesses. As far as possible, the Applicant and contractors must fill employment positions with local personnel from the immediate area and make use of local goods and services, to enhance positive economic impacts.

Potential Negative Impacts

- **Possible increase in crime (including livestock theft) and/or fear of an anticipated increase in crime.**

The Construction Phase will result in a significant number of 'new' people frequenting the area, including employees and potential job seekers, with new access routes being created to the farms as well. The increased activity in the area may also attract criminals. Farmsteads are particularly vulnerable to crime given their often remote and rural locations thus a fear of increased crime can be expected whether crime actually increases or not.

It is therefore recommended to guard against creating unrealistic expectations and that the application process be conducted at the expected source of local employment, to avoid a potential influx of work seekers to the area immediately surrounding the solar facility. The Applicant will need to strictly manage personnel on site and private entrances. Sufficient security staff will need to be placed at the solar facility during all phases of the proposed development.

- **Impacts affecting the sense of place and disruption to daily living (including increased noise)**

Impacts affecting the sense of place, disruption to daily living and increased noise have been grouped together here, because they overlap and impacts stem from the same source. While these impacts have significant potential to be a nuisance and inconvenience to farmers and residents, they are temporary and will, in the case of noise and activity, largely cease with completion of construction. Implementation of mitigation measures will be important to ensure impacts remain within acceptable levels.

Operational Phase

The significant social issues associated with the Operational Phase include:

Potential Positive Impacts

- **Electricity generation from a renewable resource**

Development of the proposed solar facility will help address the electricity shortage South Africa is experiencing and will be doing so utilising a renewable resource, helping shift the country to more sustainable energy production methods. On an individual scale electricity generation is anticipated to have a Medium positive impact, with Medium positive cumulative impacts when one considers future such developments.

- **Job creation and economic knock-on effects**

Once operational, approximately 15 to 20 full-time employment positions will be created. A limited number of these positions will be unskilled, so some of them will need to be filled by skilled individuals, potentially from outside the local area. The additional jobs created are anticipated to have a positive Medium impact on the surrounding community, or a very localised positive High impact for those employed. Likewise, very localised positive High impacts will occur for the landowners hiring their land to the Applicant. Positive economic knock-on effects will be experienced by local businesses from money spent by those employed and the Applicant on local goods and services, but to a much lesser degree than is anticipated during the Construction Phase.

Potential Negative Impacts

- **Loss of sense of place and decreased satisfaction with living environment**

The visual impact of the proposed solar facility is the chief impact from which a loss of sense of place and a decreased satisfaction with the living environment will stem. The development site and surrounds have a fairly flat topography with a generally low vegetation structure which means the proposed solar facility will be fairly visible from the surrounds. Glare and seeing industrial infrastructure will detract from the areas rural sense of place which the farmers and residents in the area are accustomed to. Activity from daily operations will disturb daily life, although this is expected to be limited during the Operational Phase. Impacts to sense of place are not anticipated to extend to the suburb of Riebeeckstad.

- **Decreased tourism potential**

The decreased potential for tourism primarily concerns the economic viability of game farming. Concerns were raised by game farmers, whose operations rely on the area's sense of place to create a "being in Africa" feel which is particularly important for attracting overseas clients. On its own,

the facility is expected to have a Low to Medium-Low impact on sense of place but will create significant cumulative sense of place/visual impacts when one considers the other three proposed solar facilities. Impacts are the termination or compromised operation of the existing and planned game farms. These impacts will however be localised. The development of future nature-based tourist attractions on neighboring properties is unlikely, although it must be noted that environmentally sensitive areas, such as the Commandants Pan, will be avoided and their ability to serve as tourist attractions is not anticipated to be impacted.

Decommissioning Phase

As mentioned previously, similar impacts to those that will occur during construction, will occur during the Decommissioning Phase. A temporary increase in economic benefits, through the jobs created and the spend on local goods and services, can be expected. Once decommissioned, the sense of place will be returned to what it is currently, assuming that no other industrial type developments have taken place around the proposed development site. Negative impacts include job losses if not relocated (approximately 15 to 20 full time positions), a potential temporary increase in crime and disturbance to daily life, but overall impacts are anticipated to be positive during and after decommissioning, assuming that an alternative facility has or will be developed elsewhere to continue to meet electricity needs.

Cumulative Impacts

The proposed Khauta South solar facility forms part of the Khauta cluster, including three other solar facilities. Developing Khauta South, along with the other three solar facilities will significantly cumulate impacts to sense of place, which is anticipated to be the most significant negative cumulative impact during the construction and operational phases. This will particularly occur around the Commandants Pan, where Khauta North adjoins Khauta South, surrounding the Pan on its western and norther edges. Furthermore, Environmental Authorisation has been granted for seven other solar facilities within 30km of the Khauta cluster, with the closest of these being 11.4km away. With the implementation of mitigation measures, other negative impacts are expected to be Low to Medium when factoring in the other solar facility developments. Infrastructure will also incur cumulative impacts, considering that many of the Free State's roads are in a poor state, which will be compounded, particularly gravel roads, with additional construction vehicles frequenting the roads in the area. If all four facilities are constructed, they should be constructed at the same time, to restrict Construction Phase impacts to the shortest time period.

During the Operational Phase, cumulative electricity generation capacity is anticipated to have a Medium-High benefit.

While clustering of the solar facility will result in cumulative impacts of a Medium nature, it is the preferred option, as it restricts social impacts to one area. It must be noted that these impacts will be fairly localised, i.e. only affecting the surrounding farms, and as such is not regarded as a fatal flaw.

Assessment of the No-Go Option

Potential Positive Impacts

The No-Go option would result in the current land use continuing, i.e. agriculture. There would be no impact to the area's sense of place and there will be no increase in crime or fear of an increase in crime (solely as a result of the solar facility). The financial viability of the two nearby game farms in the area would be unaffected and the potential for future tourist activities or developments around Commandants Pan will not be affected. Positive impacts in terms of sense of place and satisfaction with the living environment would be relatively localised, as there are only approximately 8 neighbouring farmsteads.

Potential Negative Impacts

Negative impacts associated with the No-Go option include forfeiting the jobs that could be created and the spend on local goods and services. Considering the relatively high unemployment rate of the local municipality and declining mining industry in the area, this is not favourable. An opportunity to mitigate the electricity shortages being experienced in South Africa and to strengthen the renewable energy sector will not be realised. Opportunities to develop the facility, or similar will have to be sought elsewhere.

CONCLUSIONS AND RECOMMENDATIONS OF THE FINDINGS

Conclusions

This SIA has found the surrounding community to generally be accepting of the proposed solar facility development, although there are at least two instances where surrounding landowners have raised objections relating to the cumulative impacts that the solar cluster, including Khauta South, will have on the area's sense of place.

A change in sense of place is anticipated to be the most significant impact experienced by surrounding and nearby landowners and at the Commandants Pan. Impacts to the sense of place will occur during both the Construction and Operational Phases, but are expected to be greater during the Operational Phase given the duration of the impact (i.e. for the entire life time of the solar facility). The Free State PSDF notes that the locating of renewable energy developments must avoid visual impacts on landscapes of significant symbolic, aesthetic, cultural or historic value and should blend in with the surrounding environment as far as possible. The landscape surrounding the proposed development does hold aesthetic value at a local scale, but not at a regional scale, thus sense of place impacts will be localised. Negative impacts of an economic nature due to a change in sense of place are expected to be limited to the known game farms. The significance of a change in sense of place impact will thus vary between landowners based on whether it has economic implications (game farmers) or is only a nuisance. Where the impact is economic, animosity towards the solar facility may be created as well as fear/anxiety over future economic viability. Altering the sense of place will also reduce the likelihood of future tourism-related initiatives in the immediate area.

Disturbance to daily life, due to increased noise and activity in the area, will be temporal and chiefly associated with the Construction Phase. Through implementing mitigation measures, good planning and close working with the surrounding landowner, these impacts can be reduced to acceptable levels. A potential increase in crime, while also likely to be temporal, needs to be mitigated however possible, as it has the potential to have Very High negative consequences if impacts are realised. While an increase in crime is not entirely within the Applicant's control, they must work closely with farmers to reduce the potential for an increase.

It is expected that potential health impacts (dust and construction and/or road accidents) during construction can be sufficiently mitigated and are not expected to be a significant concern.

Economic benefits to the surrounding area, including job creation and money spent on local goods and services, will be significant and benefits are expected to outweigh the negative economic impacts (van Jaarsveld, 2022). Economic benefits will extend across the Construction and Operational Phases, with greater positive impacts expected during the Construction Phase. Positive economic impacts relate directly to positive social impacts. With a decline in the mining industry (Myburgh and Bastile, 2019), developing the solar facility will assist in offsetting job losses, albeit a small influence.

The proposed development can be considered to align with the reviewed planning documentation, as it is expected to have positive economic impacts which outweigh other impacts, without significantly compromising other sectors. While it must be noted that the Xhariep region and existing solar energy projects at Dealesville and Boshof have been identified as preferred areas for future solar developments, developing the proposed solar facility will allow the Riebeeckstad/Welkom areas to also experience the benefits of solar PV projects, assuming negative impacts are within acceptable levels.

Cumulative Impacts

Khauta South as a standalone solar facility will have Low to Low-Medium social impacts but when considering the three other solar facilities proposed, all impacts will be more likely Medium to High-Medium. Sense of place is anticipated to be impacted the most significantly by the cumulative visual impact of the four solar facilities. The clustering of the solar facility is however preferred, as it restricts social impacts to one area. Clustering additionally reduces the overall footprint, reducing the infrastructure required to connect to the main electricity grid, lowering the overall social and environmental impact. Impacts to sense of place are not regarded as a fatal flaw, given that they will be localised.

Daily living will be disrupted, and more so if there are larger construction crews in the area due to several solar facilities being constructed. Through implementing mitigation measures, as provided in this report, the majority of cumulative impacts can be reduced to a Low significance.

Road infrastructure in the area will be temporarily impacted by increased traffic flow during the construction period.

Recommendations

Mitigation measures to reduce negative impacts and improve positive impacts have been provided and must be included in the Environmental Management Programme. While these mitigation measures aim to address the range of social impacts identified, the list is not exhaustive and other mitigation measures may be applicable.

Disruption of daily living

- Construction works must be restricted to usual work hours, 07:00 – 18:00, Monday to Saturday. No work on Sundays and public holidays.
- Delivery of construction material and components must be restricted to usual work hours.
- A Code of Conduct must be drawn up and personnel must adhere to the code.
- Use attenuation for machinery and screen noisy activities were possible.

- Notify residents prior to conducting activities that may cause excessive noise.
- The Applicant and their appointed contractors must maintain good communication channels with the farmers in the surrounding area and notify them timeously if any activities will take place which may disrupt the farmers daily activities.
- Access roads must not be blocked.
- Activities and personnel on site must be managed in a way that ensures minimal noise is generated during daily operation.
- A Complaints Register must be maintained and measures to address complaints must be implemented timeously.

Loss of sense of place/visual impact

- The chosen design for the solar panels and other infrastructure should be of the lowest profile possible. The recommendations of the Visual Impact Assessment (du Plessis, 2022) must be implemented in this regard. These mitigation measures include, but are not limited to:
 - [Khauta Solar PV Facilities are to liaise with relevant I&APs within a two kilometre \(2 km\) radius whom have raised concerns about possible visual impacts. The objective of liaising with the I&APs will be to determine the areas of higher visual influence which must be screened with indigenous vegetation. Indigenous tree species, able to grow to 10m in height, should be planted as a minimum along the northern, north-eastern and eastern borders;](#)
 - Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare;
 - If the perimeter fence consists of palisade fencing, the palisading must be painted either a red-brownish or light brown- colour; and,
 - The power station buildings must be painted a light brown or red-brownish matt colour to ensure a higher landscape compatibility.
- Retain as much natural vegetation as possible on the site, particularly along the site boundaries.
- Limit the amount of lighting on site to what is necessary.

Potential increase in crime and/or fear of an increase in crime

- The recruitment process should be conducted at the expected source of local laborers, in order to avoid a potential influx of work seekers to the area immediately surrounding the solar facility.
- Contractors to strictly monitor for any non-employees on site and to report any immediately.
- All employees are required to have a form of identification.
- No farm gates to be left open.
- Farmers to report cases of livestock theft to the Contractor to investigate internally. If it can be proved that particular instances of livestock theft were a direct result of the construction activities on the solar facility farmers must be compensated.
- The Applicant and Contractors to work closely with farm watch groups.
- No construction personnel to be accessing or leaving the construction site before 05:00 or after 20:00.

- Apart from security personnel, no construction staff are to remain on site overnight. All personnel are to be housed offsite.
- Sufficient security staff must be placed at the solar facility during all phases of the proposed development.

Health implications

- Monitor dust levels and ensure dust mitigation measures are in place.
- All employees to be supplied with appropriate PPE.
- Speed limits must be enforced on access roads.
- As far as possible, employment positions should be filled by local persons residing in the area.
- HIV/AIDS awareness talks to be incorporated into induction talks.
- No non-employees to be allowed on the construction site/construction camp.

Increased demand on existing infrastructure

- The Applicant must draw up and agreement with local farmers and the municipality for the maintenance of gravel access road and contribute to the maintenance of the roads as per the agreement. The Applicant's responsibilities with regard to road maintenance must be confirmed prior to construction commencing.
- The Applicant should consider contributing to the maintenance of tarred roads, in collaboration with the local municipality.

Creation of employment opportunities and knock-on effects for local business

- As far possible, fill employment positions with local personnel from the surrounding areas.
- If there is a deficit of locals who are sufficiently skilled, the Applicant should endeavour to provide training for locals to fill the positions.
- As far as possible, the developer and Contractor must make use of local service providers for building materials, accommodation, food and services.
- Electricity must first be used within the Free State Province, as stipulated in the Free State Provincial Spatial Development Framework.

IMPACT STATEMENT

The findings of this SIA indicate that if mitigation measures are implemented, negative impacts can be lowered to acceptable levels. The findings from the SIA anticipate that the social benefits received out-weigh the negative impacts. Significant negative impacts, associated with a loss of sense of place, are anticipated but these impacts will be localised (i.e. limited to surrounding landowners), whereas positive economic impacts are expected to be further reaching, at least to a municipal level. Despite being localised, impacts to surrounding landowners, in particular game farmers (affected by a change in sense of place), must be considered and mitigated wherever possible. Measures to lower the visual impacts during the Operational Phase will be key in lowering significant cumulative impacts to 'sense of place' that will be experienced by surrounding landowners. The renewable energy generated must first be used to address the needs of the province before being exported, as stated in the PSDF.

It must be noted that if mitigation measures are not adhered to then construction of the proposed solar facility could have high negative impacts on the surrounding landowners and the area's current and future tourism industry.

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ABBREVIATIONS

DMRE	Department of Mineral Resources and Energy
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
FSP	Free State Province
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IPP	Independent Power Producer
LDM	Lejweleputswa District Municipality
LED	Local Economic Development
Megawatt	MW
MLM	Matjhabeng Local Municipality
NEMA	National Environmental Management Act, 1998
PSDF	Provincial Spatial Development Framework
PPP	Public Participation Process
PV	Photovoltaic
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
The Applicant	Khauta South Solar PV Facility RF (Pty) Ltd
SPV	Solar Photovoltaic
SIA	Social Impact Assessment

1 INTRODUCTION

1.1 INTRODUCTION

Enviroworks was appointed by WKN Wind Current SA (Pty) Ltd, the owner of Khauta South Solar PV Facility RF (Pty) Ltd, to undertake a Social Impact Assessment (SIA) for the proposed development of a 110 MW solar photovoltaic facility, Khauta South Solar Facility north-east of Riebeeckstad, Free State Province. This report has been compiled by Enviroworks.

King's Landing 507 Trading (Pty)Ltd t/a Enviroworks, part of the SHE Group, is a professional Environmental Specialist, Compliance, Training and Advice Consultancy. Enviroworks, established in 2002 is backed by a collective 75 years of professional service and experience in the environmental field. The qualifications and expertise of the professional team forms the backbone of the company's continued success. Enviroworks has grown continuously in their offering of high-quality Environmental Specialist Services *inter alia* Social Impact Assessments. Enviroworks received various awards for their services and worked both nationally and internationally.

Enviroworks consultants are members of the International Association of Impact Assessment, South Africa (IAIASa) (<http://www.iaiasa.co.za/>). As members of IAIASa, Enviroworks works according to their code of ethics.

Furthermore, Enviroworks' consultants belong to the International Association for Public Participation (IAP2) (<http://iap2sa.org/>) and adhere to the purpose and code of ethics. The Review Specialist, Ms. Elbi Bredenkamp is also registered as a Chartered Public Relations Practitioner with the Public Relations Institute of South Africa NPC (PRISA).

This SIA will form part of the Environmental Impact Assessment (EIA) process conducted by Enviroworks. The information contained within this report was sourced from:

- The Scoping Report compiled by Enviroworks,
- Comments received by Enviroworks from Organs of State and Interested & Affected Parties during the Public Participation Process,
- Relevant policy and planning documents:
 - The National Development Plan (2030),
 - Department of Environmental Affairs & Development Planning: Guideline for Involving Social Assessment Specialists in EIA Processes (2007),
 - White Paper on Renewable Energy - November 2003 (Department of Minerals and Energy),
 - Free State Provincial Spatial Development Plan 2014,
 - Lejweleputswa District Municipality: Integrated Development Plan 2017-2022,
 - Matjhabeng Local Municipality: Integrated Development Plan for The Financial Year 2017 – 2022,
 - Frank Vanclay: International Principles for Social Impact Assessment (2003),
- Consultation with Interested & Affected Parties (I&AP-) - Identification of I&APs was done by:
 - Consulting landowners within the proposed development footprint;
 - Identifying and consulting with surrounding landowners;
 - Notification and/or consultation with various Organs of State (a list of departments notified and/or consulted can be found in Appendix 3; and,

- Publishing an advert in a local newspaper to notify potential I&APs of the project and the opportunity to comment.
- Review of similar developments in the area.

The proposed 110MW Khauta South Solar Photovoltaic (SPV) Facility will cover an area of approximately 168ha and will result in social impacts during its construction, operation and decommissioning phases. In order to ascertain the potential impacts on the surrounding communities, a SIA study was commissioned. The proposed facility forms part of a proposed solar photovoltaic (PV) cluster, which includes three other similar solar PV developments adjacent to it. This creates a potential for significant cumulative social impacts.

This SIA aims to determine and assess the social impacts associated with the proposed solar facility development as well as to provide measures to increase positive impacts and mitigate negative impacts.

1.2 TERMS OF REFERENCE

The key aim of this SIA is to identify, describe and assess impacts of a social nature that may arise as a result of the proposed solar facility development. The Terms of Reference for this SIA require the following:

- A description of the environment surrounding proposed solar facility development that may be affected by the development as well as the manner in which the surrounding environment may be affected.
- A description and assessment of the potential social issues associated with the proposed solar facility development and associated activities.
- Identification of enhancement and mitigation measures aimed at maximising opportunities and avoiding and or reducing negative impacts associated with the proposed solar facility development and associated activities.

1.3 APPROACH TO STUDY

The approach to the SIA is based on the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) Guidelines for Social Impact Assessment (February 2007). These guidelines are based on international best practice. The key activities in the SIA process embodied in the guidelines was applied as follows:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), the settlements, and communities likely to be affected by the proposed solar facility development on Portion 9 of the Farm Commandants Pan No. 382, Tafel Baai Farm No. 413 and Portion 12 of the Farm Nooitgedacht No. 74.
- Collecting baseline data on the current social environment of the Free State Province, Lejweleputswa District Municipality and Matjhabeng Local Municipality.
- Identifying the key potential social issues associated with the proposed project. This required a site visit to the area surrounding the proposed development and consultation with affected individuals (organs of state and surrounding landowners).
- Assessing and documenting the significance of social impacts associated with the proposed solar facility development and associated activities.
- Identifying enhancement and mitigation measures to enhance benefits and reduce the significance of negative impacts.

The identification of potential social issues associated with the proposed solar facility development has been based on:

1. Observations during the project site visit;
2. Consultation with Interested and Affected Parties (I&APs);
3. Review of relevant documentation;
4. Review of similar projects; and,
5. Review of the general area.

1.3.1 Definitions of social impacts

Social impacts can be defined as consequences (positive and negative) to human populations of any public or private actions (including policies, programmes, plans and/or projects) that alter the ways in which people conduct everyday life. These impacts are felt at various levels, including:

- 1) Individual level;
- 2) Family or household level;
- 3) Community;
- 4) Organisation;
- 5) Society level.

A SIA should therefore enable the relevant interested and affected parties (authorities, project proponents, individuals, communities, and organisations) to understand and be in a position to identify and anticipate the potential social consequences of the implementation of a proposed policy, programme, plan, or project.

The outcome of this SIA process will therefore:

1. Alert communities and individuals within the area surrounding the proposed solar facility development to the proposed project and potential social impacts.
2. Allow local communities to assess the implications and identify potential alternatives.
3. Alert proponents and planners to the likelihood and nature of social impacts associated with the proposed solar farm development.
4. Enable proponents to anticipate and predict social impacts in advance, so that the findings and recommendations of the assessment are incorporated into and inform the planning and decision-making process.

Social impacts are complicated by the way in which different people from different cultural, ethnic, religious, gender, and educational backgrounds etc. view the world. This is referred to as the “social construct of reality.” The social construct of reality informs people’s worldview and influences the way in which they react to changes.

1.3.2 Timing of Social Impacts

In terms of timing, all projects and policies go through a series of phases, usually starting with initial planning, followed by construction, operation, and finally decommissioning. The activities, type of activities and duration of the social impacts associated with each of these phases are likely to differ.

1.4 ASSUMPTIONS AND LIMITATIONS

1.4.1 Assumptions

- It is assumed that the development site represents a technically suitable site for the development of a solar PV facility, that feasibility studies were undertaken with integrity and accurately reflect the site suitability.
- It is assumed that all information provided by the independent Environmental Assessment Practitioner was accurate and true.
- It was assumed that the information gathered through the public participation process accurately reflects the attitude of the public towards the proposed development and as such was accurately recorded.
- Legislation and policies reflect societal norms and values. The legislative and policy context therefore plays an important role in identifying and assessing the potential social impacts associated with a proposed development. In this regard a key component of the SIA process is to assess the proposed amendment in terms of its fit with key planning and policy documents. As such, should the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and guidelines contained in the relevant legislation and planning documents, and there are no significant or unique opportunities created by the proposed solar farm, the development of a solar farm at the proposed site cannot be supported.

1.4.2 Limitations

- The baseline study was conducted primarily using available census data from either the 2011 Census or 2016 Community Census, which are the most recent sources of official statistics. While the data does provide useful information regarding the socio-economic situation of the area concerned, it needs to be noted that the data is now somewhat outdated and actual population demographics likely differ.
- While this study did attempt to make use of as wide a range of data sources as possible, there was a limitation due to time and budgetary constraints.

1.5 SPECIALIST DETAILS

This report, and appendixes, was compiled by Elbi Bredenkamp and Michael Leach of Enviroworks.

A detailed Curriculum Vitae for each specialist is provided as **Appendix 2**.

DECLARATION OF INDEPENDENCE

This confirms that Elbi Bredenkamp and Michael Leach, the specialist consultants responsible for undertaking the study and preparing the report, are independent and do not have vested or financial interests in the proposed project being either approved or rejected.

1.6 REPORT STRUCTURE

The report is divided into five sections, namely:

- Section 1: Introduction
- Section 2: Policy and planning environment
- Section 3: Overview of the study area

- Section 4: Consultation process
- Section 5: Key socio-economic issues
- Section 6: Assessment of impacts
- Section 7: Key findings and recommendations.

1.7 PROJECT LOCATION AND DESCRIPTION

1.7.1 Project Background Summary

As per the Scoping Report, the Applicant, Khauta South Solar PV Facility RF (Pty) Ltd, proposes to establish a commercial solar photovoltaic (SPV) facility with an output capacity of 110 Megawatts (MW). Based on a pre-feasibility analysis and environmental screening undertaken by Khauta South SPV Facility RF (Pty) Ltd, a favourable area has been identified for consideration. This has been verified in the Environmental Impact Assessment (EIA) process.

The Khauta South SPV Facility and associated infrastructure are proposed to be located on Portion 9 of the Farm Commandants Pan No. 382, Tafel Baai Farm No. 413 and Portion 12 of the Farm Nooitgedacht No. 74, about 3.5km north-east of Riebeeckstad, within the Matjhabeng Local Municipality in the Free State Province. The facility is envisaged to have a maximum export capacity of 110 MW power to be achieved through several arrays of PV panels and the following associated infrastructure:

- PV modules and mounting structures (monofacial or bifacial) with fixed, single or double axis tracking mounting structures;
- Associated stormwater management infrastructure;
- Battery Energy Storage System (BESS);
- Site- and internal access roads (up to 6 m wide);
- Auxiliary buildings (offices, parking, etc.);
- Ablution facilities and associated infrastructure;
- Temporary laydown area during the construction phase (which will be a permanent laydown area for the BESS during the operational phase);
- On-site 33/132 kV substation (facility substation) and associated 33/132 kV collector transmission line;
- Grid connection infrastructure including medium-voltage cabling between the project components and the facility substation (underground cabling will be used where practical);
- Perimeter fencing; and,
- Rainwater and/or groundwater storage tanks and associated water transfer infrastructure.

The proposed Khauta South SPV Facility development requires a development footprint of approximately 168ha and is located within the broader area of approximately 1 680.15ha, made up of the three farms. Therefore, the PV facility can be appropriately sited within the broader area such that any identified environmental sensitivities can be avoided.

The benefits of renewable energy facilities, such as the proposed Khauta South SPV Facility, to national, provincial, and local development goals are as follows:

- The proposed project shall benefit several key areas from broader international policy to local development goals;

- Assist South Africa in meeting international greenhouse gas emission reduction targets as set under the Kyoto Protocol;
- Support goals and objectives of South African national policy on climate change and renewable energy provisions, such as the Integrated Resource Plan of 2010/2018;
- Support the mandate of the National Energy Regulator of South Africa (NERSA) and the Department of Energy (DoE) Independent Power Producers (IPP) procurement programme which aims to capacitate clean energy generation through feed-in mechanisms;
- Give mobility to the Free State Province's SDF's principles of promoting land use, of being a developmental state, aligning environmental management priorities and sustainable economic growth under the Free State Growth and Development Strategy;
- Meeting the needs of the Matjhabeng Local Municipality's IDP, namely those of developing a positive contribution to national policies and strategies and promoting human resources through training and implementation of new technological aids. The need for infrastructure development is further mentioned as an objective hereof;
- The local community shall benefit from long-term economic incentives including both short- and long-term job creation; and,
- As a consequence of these economic incentives, positive social impacts include skills development.

1.7.2 Locality

The proposed Khauta South SPV facility will be situated on part of Portion 9 of the Farm Commandants Pan No. 382 (761.65ha), Tafel Baai Farm No. 413 (85.7ha) and Portion 12 of the Farm Nooitgedacht No. 74 (832.58ha). The farm is situated about 3.5km north-east of Riebeeckstad, within the Matjhabeng Local Municipality in the Free State Province. The proposed Khauta South SPV Facility development requires a development footprint of approximately 168ha. The proposed facility is surrounded by agricultural land, predominantly used for extensive crop planting, grazing and game farming. A large natural pan, Commandants Pan, is situated approximately 250m west of the proposed development site.

The boundaries of the Khauta South SPV Facility are located at the following approximate coordinates:

- 27° 53' 26.59" S; 26° 51' 51.69" E
- 27° 53' 26.03" S; 26° 52' 17.42" E
- 27° 53' 44.54" S; 26° 52' 12.99" E
- 27° 54' 2.92" S; 26° 52' 21.88" E
- 27° 54' 6.50" S; 26° 51' 51.46" E
- 27° 54' 2.95" S; 26° 51' 34.09" E
- 27° 54' 26.17" S; 26° 51' 43.37" E
- 27° 54' 37.40" S; 26° 51' 17.08" E
- 27° 54' 27.59" S; 26° 51' 2.23" E
- 27° 54' 25.94" S; 26° 51' 15.35" E
- 27° 54' 17.78" S; 26° 51' 22.00" E
- 27° 54' 3.38" S; 26° 51' 22.79" E
- 27° 53' 55.16" S; 26° 51' 30.75" E
- 27° 53' 48.80" S; 26° 51' 40.78" E
- 27° 53' 38.13" S; 26° 51' 51.45" E

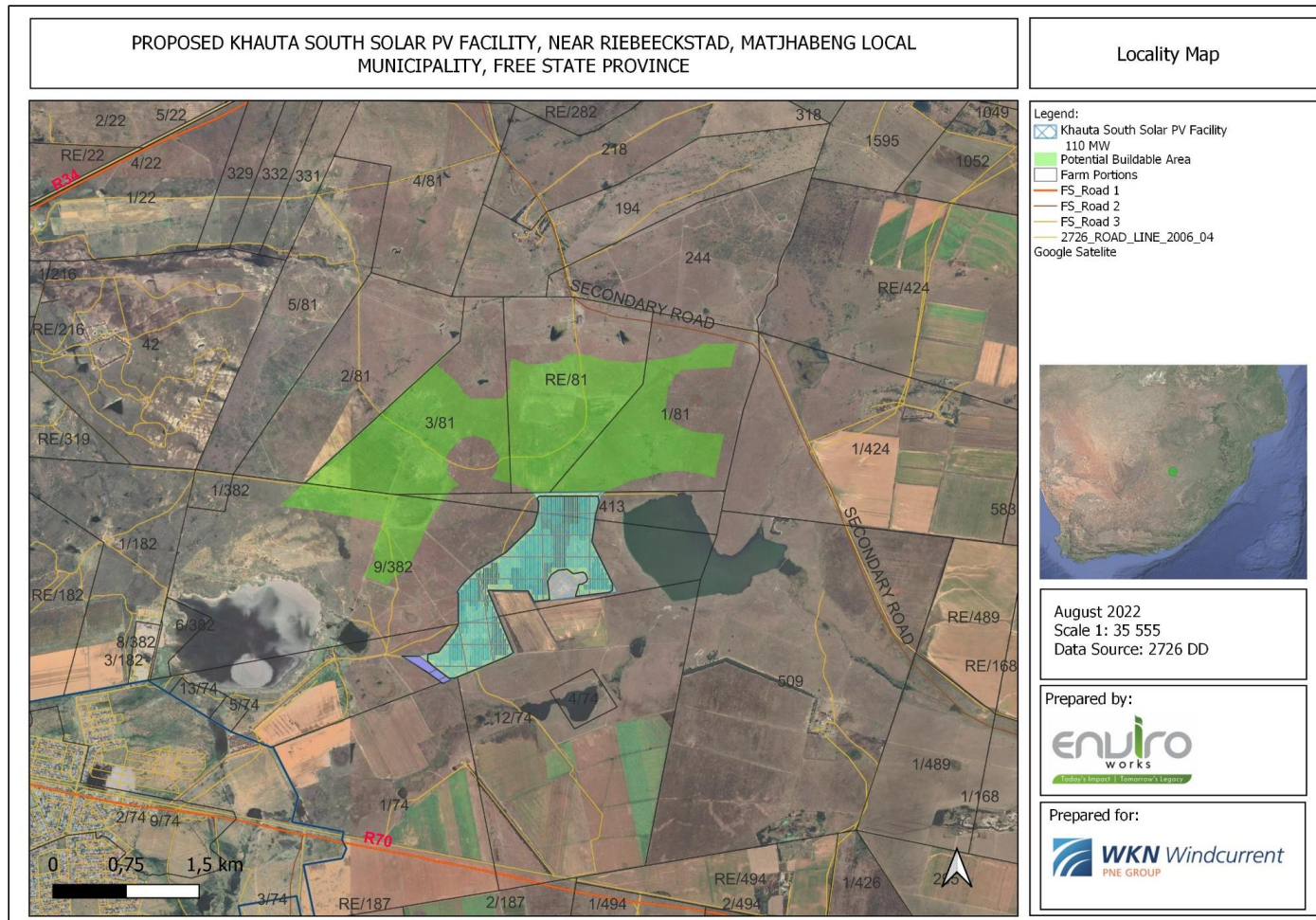


Figure 1: Locality Map of the proposed 110MW Khauta South Solar Photovoltaic Facility

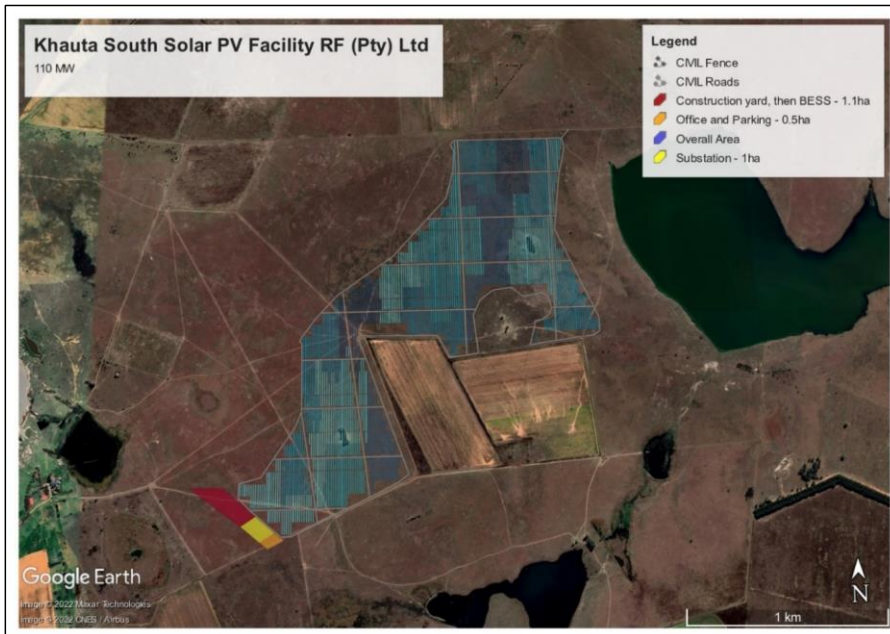


Figure 2: Preliminary layout of the proposed 110MW Khauta South Solar PV Facility

1.8 ALTERNATIVES

Possible alternatives that could be considered include:

1. Site Alternatives;
2. Layout Alternatives;
3. Design alternatives (i.e. height of the solar panels);
4. Technology alternatives for the solar panels - fixed/mounted PV panels or tracking PV panels (solar panels that rotate to follow the sun's movement/trajectory);
5. Technology alternatives for the battery energy storage system (BESS) – solid state batteries or redox flow batteries; and,
6. The No-Go option

Various alternatives were considered leading up to the Scoping Phase and in the Scoping Report. The alternatives considered and the outcomes are detailed in the Scoping Report. Various layouts were considered in the initial Scoping Phase, particularly taking into account sensitive environmental areas, and a recommended layout was provided for further assessment in the Social Impact Assessment. Of note, are visual impacts, which can vary based on the technology type and design used. Various technologies and designs should be considered to ensure that the final technology and design is one which has the lowest visual impact. As assessing visual impacts is outside of the expertise of the Specialist and considering that a Visual Impact Assessment has been conducted as part of the EIA process, the different design and technology types have not been assessed in this report. It has rather been recommended that the alternative with the lowest visual impact be used, as per the findings of the Visual Impact Assessment (du Plessis, 2022).

The design of the solar panels also determines whether agricultural activities (such as grazing beneath the solar panels) may still be feasible. Where possible, the preferred alternative should allow for agricultural activities to continue. Lower visual impacts would however take preference in this regard.

Various layout alternatives were considered, and a preferred layout was determined based on environmental sensitivities and infrastructure considerations. By excluding sensitive areas such as the Commandants Pan, tourism potential is also upheld, for example these areas will still provide a birding attraction.

Based on the abovementioned initial consideration of various alternatives, during the Scoping Phase, only a preferred layout and technology type were provided to be assessed by the Social Specialist, and thus only the Preferred Alternative and the No-Go Alternative have been assessed in this report.

1.9 NEED FOR PROJECT

This section provides an overview need and desirability of the proposed Khauta South SPV Facility. The overall need for alternative energy resources ('green energy') is a result of the known environmental impacts associated with coal power generation through which most of South Africa's electricity is currently being generated. These impacts include greenhouse gases, as well as other air pollution, water use, and carbon tax, making 'green energy' a more favourable alternative for meeting the growing need for electricity

The commercial feasibility for the proposed 1100MW Khauta South SPV Facility to be built on private land near Welkom, has been informed by its contextual location, and economic, social and environmental impacts and influence.

The need to expand and increase electricity generation capacity in the country is based on national policy and informed by on-going strategic planning undertaken by the Department of Mineral Resources and Energy (DMRE). In an effort to further the country's renewable energy development imperatives, Government has been actively encouraging the role of Independent Power Producers (IPPs) to supply the national grid. Through its Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), the DMRE has been engaging with the sector with the aim of strengthening the role of IPPs in renewable energy development. In light of this objective, the REIPPPP was launched in 2011 which is designed to contribute towards achieving the target of generating 3 725MW from renewable energy sources, and towards socio-economic and environmentally sustainable development, as well as to further stimulate the renewable industry in South Africa.

The economic viability of a SPV facility is directly dependent on the annual solar irradiation at the site. From a regional site selection perspective, this region is considered to be preferred for solar energy development by virtue of its annual solar irradiation values. Power generation is one of the rare growth opportunities for the Free State Province due to the high solar irradiation levels. The Global Horizontal Irradiation (GHI) for the area derived from the World Bank Group's Global Solar Atlas is approximately 2 128 kWh/m²/annum.

Furthermore, ease of access into the Eskom electricity grid is vital to the viability of a SPV facility. Projects which are in close proximity to a connection point and/or demand centre are favourable, and reduce the losses associated with power transmission. Two connection options are being considered. Given the proximity of the site to the existing 132 kV power line (±5 km from the site) connecting to the Eskom grid with a loop-in loop-out configuration is deemed most appropriate, if the

Commented [DJ2]: Loop-in loop-out

Commented [DJ3]: This will only be most appropriate if the combined capacity of all Khauta projects adds up to 200MW or less (and if nobody else has connected in before we do)... otherwise Leander SS or Everest SS is preferred.

[combined capacity of the Khauta Cluster is less than 200 MW and there are no prior connections by other energy producers](#). Alternatively connecting to the Everest Substation (± 12 km) or Leander Substations (± 11 km) with a new powerline [will be considered](#). Both options allow for a feasible connection point. The SPV site is also located within the strategic transmission corridor (Central Corridor) which facilitates the planning of electricity transmission and distribution infrastructure, allowing for the fast tracking of applications for Environmental Authorisation for electricity transmission and distribution expansion. Strategic Transmission Corridors were compiled in terms of section 24(3) of National Environmental Management Act, 1998. This development will create growth opportunities for the area, and the establishment of a renewable energy project is considered important to diversify and complement the economic development of the region.

The benefits of renewable energy facilities to local regions are not confined to the initial investment in the project. They also provide a reliable and on-going income for landowners and the municipality, creating direct employment opportunities for locals, as well as flow-on employment for local businesses through provision of products and services to the project and its employees.

During the estimated 18-month construction phase, job opportunities will involve about 5 000 man-months, or approximately 333 full time jobs. Approximately 15-20 full time jobs will be created during the operational phase. A limited number of these jobs will be unskilled positions. Due to the fact that there is limited local skilled labour in the field of renewable energy, the employment structure will likely consist of local and outside capacity. To guarantee successful operations over the lifetime of the investment, Khauta South SPV Facility will likely use the skills of outside labour to cross-train local specialists. This cross training and skills development will take place especially in the area of technical maintenance and administration.

The benefits of renewable energy facilities, such as the proposed Khauta South SPV Facility, to national, provincial, and local development goals are as follow:

- The proposed project shall benefit several key areas from broader international policy to local development goals;
- Assist South Africa in meeting international greenhouse gas emission reduction targets as set under the Kyoto Protocol;
- Support goals and objectives of South African national policy on climate change and renewable energy provisions, such as the Integrated Resource Plan of 2010/2018;
- Support the mandate of the National Energy Regulator of South Africa (NERSA) and the DMRE REIPPP;
- Give mobility to the Free State Province's SDF's principles of promoting land use, of being a developmental state, aligning environmental management priorities and sustainable economic growth under the Free State Growth and Development Strategy;
- Meeting the needs of the Matjhabeng Local Municipality's IDP, namely those of developing a positive contribution to national policies and strategies and promoting human resources through training and implementation of new technological aids. The need for infrastructure development is further mentioned as an objective hereof;
- The local community shall benefit from long-term economic incentives including both short- and long-term job creation; and,
- Skills development is expected as one of the knock-on effects.

2 POLICY AND PLANNING ENVIRONMENT

2.1 INTRODUCTION

Section 2 of this social impact report provides an overview of the most significant policy documents of relevance to the proposed solar facility. The key documents reviewed included the following:

- The National Development Plan (2030)
- Department of Environmental Affairs & Development Planning: Guideline for Involving Social Assessment Specialists in EIA Processes (2007)
- White Paper on Renewable Energy - November 2003 (Department of Minerals and Energy)
- Free State Provincial Spatial Development Plan 2014
- Lejweleputswa District Municipality: Integrated Development Plan 2017-2022
- Matjhabeng Local Municipality: Integrated Development Plan for The Financial Year 2017 – 2022
- Frank Vanclay: International Principles for Social Impact Assessment (2003)
- Environmental Assessment Reports for other projects in the area

2.2 SUMMARY OF REVIEWED DOCUMENTS

2.2.1 The National Development Plan (2030)

The National Development Plan (NDP) contains a plan aimed at eliminating poverty and reducing inequality by 2030 making this one of the guiding objectives of the NDP over the next 20 years. The NDP aims to address poverty and exclusion on the while simultaneously attempting to nurture economic growth by creating a virtuous cycle of expanding opportunities, building capabilities, poverty reduction, involving communities in their own development, all leading to rising living standards. The NDP identifies 9 key challenges and associated remedial plans. While all nine challenges/ plans are envisaged as part of an integrated whole, the highest priorities are regarded employment creation and improving the quality of national education. Expansion and acceleration of development which would result in increased employment opportunity is identified as a key intervention strategy.

2.2.2 White Paper on Renewable Energy - November 2003 (Department of Minerals and Energy)

The White Paper on Renewable Energy (November 2003) supplements the White Paper on Energy Policy, which recognises that the medium and long-term potential of renewable energy is significant. The Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.

The White Paper notes that while South Africa has numerous renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, they have thus far remained largely unexploited. As a signatory to the Kyoto Protocol, the South African Government is determined to hold to the country's commitment to reduce greenhouse gas emissions. To achieve this, Government has committed itself to developing a framework in which a national renewable energy framework can be established and operate. Apart from the reduction of greenhouse gas emissions, the promotion of renewable energy sources is aimed at ensuring energy security through the diversification of supply.

The long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer a sustainable and fully non-subsidised alternative to fossil fuels in the years to come.

2.2.3 Free State Provincial Spatial Development Framework 2014

The Free State Provincial Spatial Development Framework (PSDF) is a provincial spatial plan and strategic planning policy which addresses and adheres to all relevant policies and legislation. The PSDF aims to address the key challenges facing the Free State of needing to implement a 'developmental state' while ensuring global obligations to social, economic and environmental sustainability are achieved. The Free State PSDF supplements the Free State Growth Development Strategy (FSGDS). Together they provide a crucial tool for guiding the use of the province's resources in a way that ensures the province's development needs and priorities are met while remaining sustainable.

Renewable energy is a key focus area of the Free State Development Corporation, in particular the solar energy sector, and the 2014 PSDF planned to have renewable energy constitute 25% of the province's energy generation capacity by 2020.

The southern Free State, especially the Xhariep region is regarded as an ideal location for harnessing natural solar energy. After Upington, the Xhariep region is noted to have the second highest solar radiation index, making it an ideal area for developing concentrated solar power and photovoltaic solar power generation technologies. In the future this region could become a major source of renewable energy for the country.

The PSDF identifies several spatial planning categories (SPC), including Industrial Areas which includes extractive industries. In terms of the Spatial Plan for SPC Industrial Areas, Welkom and surrounds are identified as an industrial node. A solar and carbon credit area is set out to the west of the municipal area.

Renewable energy developments, along with other extractive industries and developments, while imperative for economic development, generally has a detrimental impact on the environment which have knock on negative effects on human-wellbeing and tourism resources.

The sustainable use of the resources (capital) of the province is a primary objective and the PSDF aims to implement and give effect to this and to ensure that the use of such resources results in meaningful and lasting benefits in terms of human well-being) and the environment. Any use of a resource must thus overall improve the conditions and circumstances characteristic of the area that will be affected by using the resource.

Within the SPC considering Surface Infrastructure, it is noted that energy infrastructure needs to be strictly regulated in terms of spatial plans and guidelines contained in the PSDF. The locating of such developments must avoid visual impacts on landscapes of significant symbolic, aesthetic, cultural or historic value and should blend in with the surrounding environment as far as possible. Furthermore, renewable energy generated must, first, and foremost, be used to address the needs of the province before being exported.

Agriculture is a key economic driver within the Free State and areas of high agricultural potential need to be protected from non-agricultural activities and used appropriately. Where agricultural land is to be used for other activities, the activities must result in meaningful benefit. With regards to industrial activities, the PSDF aims ensure that any use of the province's resources results in meaningful and

lasting benefits for the people of the province and the environment. Areas to the north and east of Riebeeckstad are identified as Intensive Agriculture and Double Density Mazie Planting respectively, for the Agricultural SPC.

Promoting sustainable tourism forms part of the PSDF. Within Tourism Scenic Corridors, efficient tourism should be encouraged and environmentally disruptive land-uses within these areas need be considered with caution. Riebeeckstad and surrounds are planned as a Tourism Route according to the SPC map.

2.2.4 Lejweleputswa District Municipality: Integrated Development Plan 2017-2022

One of the strategic objectives noted in the Lejweleputswa District Municipality Integrated Development Plan (IDP) is the reduction of greenhouse emissions in the district, through the development of solar power plant. The solar energy projects at Dealesville and Boshof have been identified as projects to be expanded into a solar energy hub for the southwestern part of the Lejweleputswa district.

The district has seen retrenchments in the mining industry, particularly affecting the mining towns of Virginia, Welkom, Odendaalsrus and Allanridge.

Welkom is an economic node within the district and is expected to remain so despite a decline in the gold mining industry of the Welkom area. Welkom serves as a main service centre within the district, providing specialised services including a hospital, institutions, regional government representation, regional banking institutions, specialised commercial and industries. Tourism in Welkom includes mining tourism and several annual events in Welkom.

2.2.5 Local Municipality: Integrated Development Plan for The Financial Year 2017 – 2022

It is noted that the Matjhabeng area has a well-established bulk electrical network. Eskom serves the mines and townships in the municipal area and thus there is sufficient bulk infrastructure available to serve the whole area. The municipality hover faces the challenge of aging electrical infrastructure. Several proposed projects for the upgrading of electrical infrastructure are included in the IDP. It is noted that Matjhabeng Municipality are endeavoring to reduce their carbon footprint and move towards a green economy.

2.2.6 Frank Vanclay: International Principles for Social Impact Assessment (2003)

This document is a statement of core values of the SIA community which is accompanied by a set of principles which can be used to guide SIA practice and the consideration of 'the social' in the EIA process. Social Impact Assessment includes the processes of analysing, monitoring and managing both intended and unintended social consequences. These consequences can be both positive or negative and are the result of planned interventions (policies, plans, projects) and the resultant social change that is invoked by such interventions. The document emphasises on the importance of sustainable interactions between humans and the environment.

2.2.7 Draft Environmental Impact Assessment Report - The Proposed Development of 75MW Photovoltaic Solar Farm and Associated Infrastructure, on the Remaining Extent of the Farm Uitkyk No. 509, Portion 1 of the Farm Helderwater No. 494, Portion 2 of the Farm Helderwater No. 494 and Portion 1 of the Farm Doornpan No. 426, Ventersburg Rd, Welkom, Matjhabeng Local Municipality, Free State Province. (2013)

Socio-economic impacts were found to represent the most significant impacts and were rated between medium to high. Several key impacts such as job creation, long-term economic stability and earning, community empowerment and skills development were all impacts of a positive nature. The benefit of the proposed development was found to be strengthened by the existing state of economic disrepair in the local community, in which high unemployment, access to water and food, and services were noted as some of the key challenges faced within the municipality.

3 OVERVIEW OF STUDY AREA

3.1 INTRODUCTION

The proposed development site is situated within the Matjhabeng Local Municipality, approximately 3.5km north-east of the suburb of Riebeeckstad, within the Lejweleputswa District Municipality, Free State Province. The Matjhabeng Local Municipality is one of five local municipalities making up the Lejweleputswa District Municipality.

Section 3 of this report provides an overview of the study area and covers:

- The relevant administrative context;
- The municipal-level socio-economic context.

3.2 PROVINCIAL OVERVIEW

3.2.1 Free State Province

The Free State Province (FSP) is the third largest province in the country and covers approximately 129 825km². Bordered by the Orange River to the south and the Vaal River to the north, the province's landscape varies greatly from Kalahari country and Highveld Grassland to mountain ranges to farmland and wilderness areas. Located at the centre of South Africa, the Free State is bordered by six other provinces, namely North West, Gauteng, Mpumalanga, Eastern Cape and Northern Cape. Lesotho borders the province on its south-eastern side. Major towns within the province include Bloemfontein, the province's capital, as well as Welkom, Sasolburg, Kroonstad and Parys.

The province is divided into the Mangaung Metropolitan Municipality and four District Municipalities, namely Fezile Dabi, Lejweleputswa, Thabo Mofutsanyana and Xhariep. These District Municipalities are then further sub-divided into nineteen Local Municipalities (Cooperative Government and Traditional Affairs, 2014).

With rich soils and good climatic conditions, the Free State is conducive to agricultural activities (Free State PGDS, 2014). Known as the 'breadbasket' of South Africa, the Free State is strongly rural and is one of South Africa's major agricultural producers, with 90% of the province's land being used for crop production. Agriculture, manufacturing and mining are the three dominant economic drivers. The province produces approximately 34% of the total maize production of South Africa, 53% of sorghum, 37% of wheat, 30% of groundnuts, 33% of potatoes, 18% of red meat, and 15% of wool. The mining industry is a major employer, with the province being the world's fifth largest producer of gold. Of note is the province's chemical industry, with the company, Sasol, producing a significant amount of synthetic-fuels <http://www.municipalities.co.za/> (Yes Media, 2022).

In terms of renewable energy, the southern Free State, especially the Xhariep region is regarded as an ideal location for harnessing the natural solar energy, with the Xhariep region is noted to have the second highest solar radiation index in the country (Cooperative Government and Traditional Affairs, 2014).



Figure 3: Map showing the Free State Province within South Africa (Wikipedia contributors, 2022).

Despite its size the FSP has the second smallest population and population density, with 2 834 714 people (Statistics South Africa, 2016a), making up approximately 5.1% of the total population for the country. The population growth rate between 2001 and 2016 was 0.14% per annum, considerably lower than the National growth rate of 1.44% per annum. Based on the 2011 Census, the ratio of males to females is fairly equal with approximately 49% (1 332 002) being male and 51% (1 427 642) being female. In respect to age structure, 29.2% of the population is under 15 years of age, while 65.5% is between 15 and 64 years with 5.3% 65 or older (Statistics South Africa, 2012). The population pyramid of the province is illustrated in **Figure 4** below.

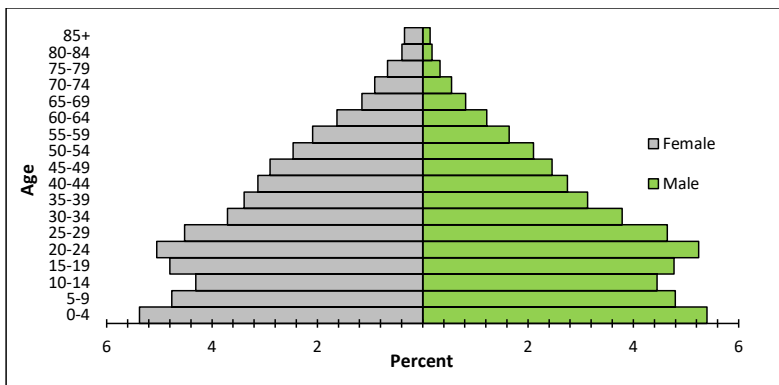


Figure 4: Population pyramid of the Free State Province (Statistics South Africa, 2014).

With regards to population groups, the majority of the population is black African, 89%, while 8% are white, 3% are coloured. The majority of the population (71%) speak Sotho as their first language. The other first languages are Afrikaans (11%), isiXhosa (6%), Setswana (5%) and Zulu (4%) (Statistics South Africa, 2016a).

The dependency ratio indicates the burden placed on the population of working age, between 15 and 64 years, who support children under 15 years and people over 65 years. The dependency ratio for the FSP is 52.9 (Cooperative Government and Traditional Affairs, 2014). The FSP saw a decrease in unemployment between 2021 and 2022 (35.6% to 31.1%) (Statistics South Africa, 2022).

According to the 2016 Community Survey (Statistics South Africa, 2016a), there were 946 637 households within the FSP. The annual average household income was R29 400. 81.1% of households lived in Formal Dwellings, while 14% lived in Informal Dwellings. Of the households, 60.9% were owned and fully-paid off, 8.7% were owned but not yet paid off and 13.6% were rented. With regards to household services, 71.8% had flush toilets and 91.28% had access to piped water within their dwelling. 93% of households had access to electricity via an inhouse electricity meter and 69.8% had regular refuse removal by a service provider (Statistics South Africa, 2016a).

Education levels in the FSP are lower than the national rate, with 39.7% completing matric or higher, compared to the national rate of 43.37% (Statistics South Africa, 2016a).

With regards to health matters, the Free State has the lowest predicted average life expectancy at birth, with males living to an average of 55 years and females 61.5 years (Statistics South Africa, 2018). HIV prevalence in the Free State is approximately 32.8%, compared to the national prevalence of 30% (Woldesenbet et al., 2021).

3.3 MUNICIPAL-LEVEL OVERVIEW

3.3.1 Lejweleputswa District Municipality

The Lejweleputswa District Municipality (LDM) is situated in the north-west of the Free State Province. LDM makes up nearly a third of the province and is subdivided in five Local Municipalities, namely Nala, Tswelopele, Masilonyana, Tokologo and Matjhabeng Municipalities. The LDM has an area of approximately 32 286km², 25% of the province's land area. Welkom is a major town within the District, which was established following the discovery of gold in the area.

LDM borders the North-West Province to the north, Fezile Dabi District Municipality to the north east, and Thabo Mofutsanyane District Municipality to the east, Mangaung Metropolitan and Xhariep District to the south and the Northern Cape Province to the west.

The main economic activities within the LDM occur within the primary and tertiary sectors, with the primary sector being driven by mining and agriculture. The LDM economy relies heavily on the gold mining sector, which is the dominant sector in the Matjhabeng and Masilonyana Local Municipalities. The other Local Municipalities are dominated by agriculture.

The mining and community service sectors are the largest employers of the District's economy. Matjhabeng is the largest municipality in the District, contributing the largest share of the Regional Gross Value Added (GVA-R) in the District.

Most of the mining activities take place within the Matjhabeng Local Municipality (MLM) in particular, gold mining, followed by Masilonyana Local Municipality with some of the gold mining and diamond mining. Lately the mining sector has been declining due to the closure of many of the shafts as a result of high costs of production among others and the need for deep mining. The situation has been worsened by a recent decline in world commodity prices (Lejweleputswa District Municipality, 2020).

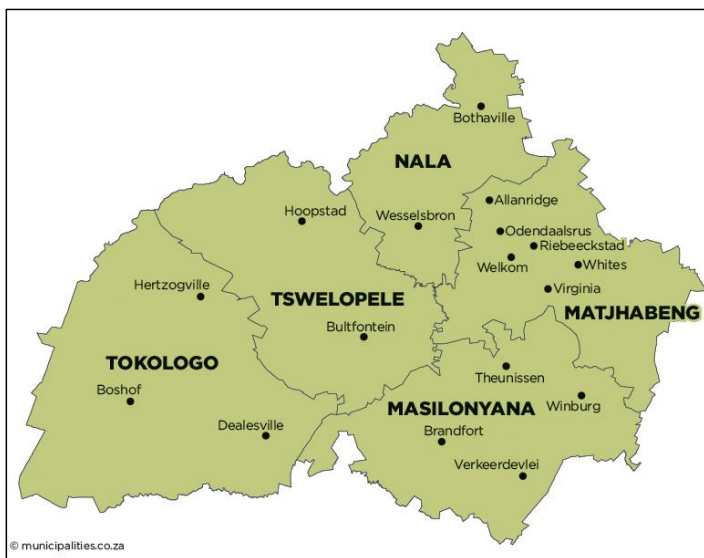


Figure 5: Map showing the LDM and the five Local Municipalities within it (Yes Media, 2022)

In terms of demographics, the LDM has a population of 646 920 people. The sex ratio of males to females is a 99.9, with 323,410 males and 323,509 females.

Black African is the largest population group, 89%. 8% percent if the population are white and 2% are coloured. 72% of the population speak Sesotho as their first language. Other significant first languages are Afrikaans (10%), isiXhosa (8%), Setswana (5%) and English (1%).

The district has a total of 217 912 households. Of the households, 82.3% live in formal dwellings, with 61.2% living in houses that were owned and fully paid off. 13.5% of households rented. Piped water is supplied directly to 93.5% of the households, with 84.1% having flush toilets. 4% have no access to electricity. 73.7% of households receive weekly refuse removal (Statistics South Africa, 2016a). Average household income for the district is shown in **Figure 6**.

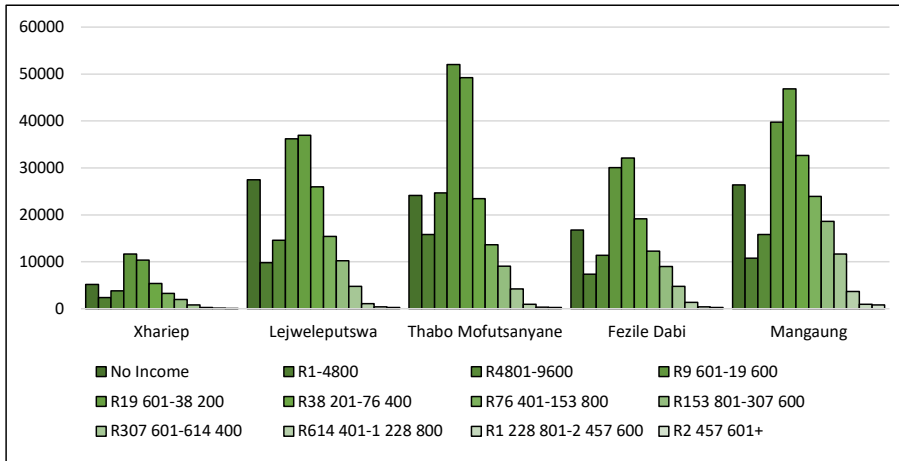


Figure 6: The distribution of households by average income for Lejweleputswa compared with the other district municipalities in the province (Statistics South Africa, 2014).

3.3.2 Matjhabeng Local Municipality

Matjhabeng Local Municipality (MLM) is situated on the eastern side of the LDM. It is bordered by Nala Local Municipality to the north, Masilonyana to the south, Tswelopele to the east and the Moqhaka Local Municipality (Fezile Dabi District) to the west. MLM has a population of 429 113 and a land mass of 5 699km². Notable towns in the municipality are Allandrige, Hennenman, Odendaalsrus, Ventersburg, Virginia and Welkom.

Demographics

The sex ratio is 50 in the MLM. Regarding the age structure of the population, the majority of the population, 63.1 %, falls within the 18-64 age bracket. 32.1% of the population are younger than 18 years old and 4.8% are 65 years or older (Statistics South Africa, 2016b). The population pyramid for MLM illustrated in Figure 7. Interesting to note is the skew in the size of the male population, particularly for the 30- 54 age bracket. This is expected to be due to an influx of males working in the mining industry. Note that these figures are based on the 2011 Census results, and the current sex/age distribution may differ.

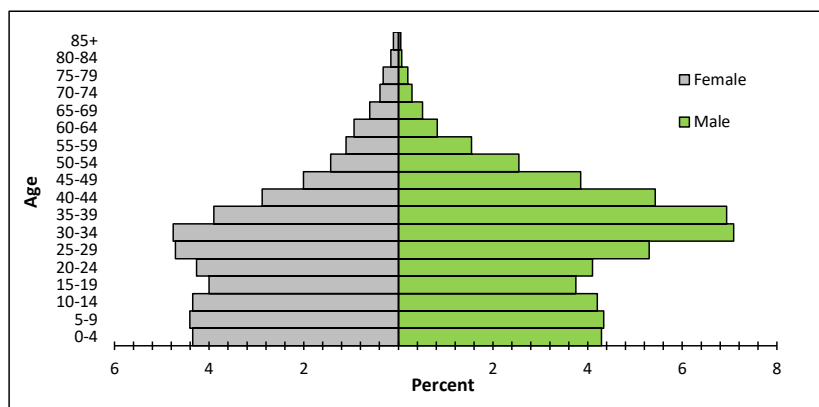


Figure 7: Population pyramid of the Matjhabeng Local Municipality (Statistics South Africa, 2012).

Population Groups and Languages

Of the 429 113 people within the MLM the majority, 89%, are black African, while 9% are white. The population groups within the MLM are fairly similar to those of the Free State Province and LDM. A comparison of the population groups for the Province, District and Local municipalities is shown in **Table 1**. The dominant first language is Sesotho, spoken by 74% of the municipality's population. The other main first languages spoken are Afrikaans, (10%), isiXhosa (9%) and English (1%) (Statistics South Africa, 2016b).

Table 1: Population groups within The Free State Province, Lejweleputswa District Municipality and Matjhabeng Local Municipality (Statistics South Africa, 2016a).

Population Group	Free State Province (%)	Lejweleputswa (%)	Matjhabeng (%)
Black African	89	89	89
White	8	8	9
Coloured	3	2	2
Indian/Asian	0.3	0.3	0.3

Households

There are a total of 149 166 households in MLM. 39.3% of households were female headed and 0.3% were child headed households (Statistics South Africa, 2016b).

Household income is an important factor indicating the welfare of the region. Households with either no income or a low income are classified as falling within the poverty level. Of the four local municipalities MLM has the highest average annual household income when compared to the other municipalities within the Lejweleputswa DM, although it was slightly below the average for the Province, as shown in **Figure 8**.

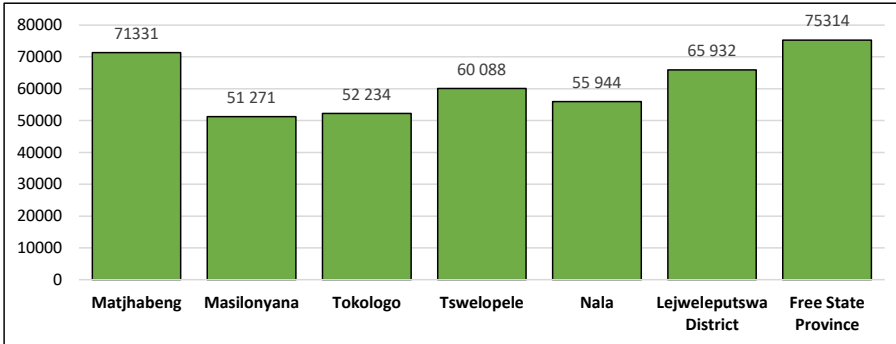


Figure 8: Average annual household income per household (R) for local municipalities within the Matjhabeng Local Municipality, the Lejweleputswa District Municipality and the Free State Province (Statistics South Africa, 2012).

When looking at the different income brackets, 38% of households fall within the Low-Income bracket, earning an annual household income of less than R20 000. Households falling within the Low Income may struggle with affording basic services.

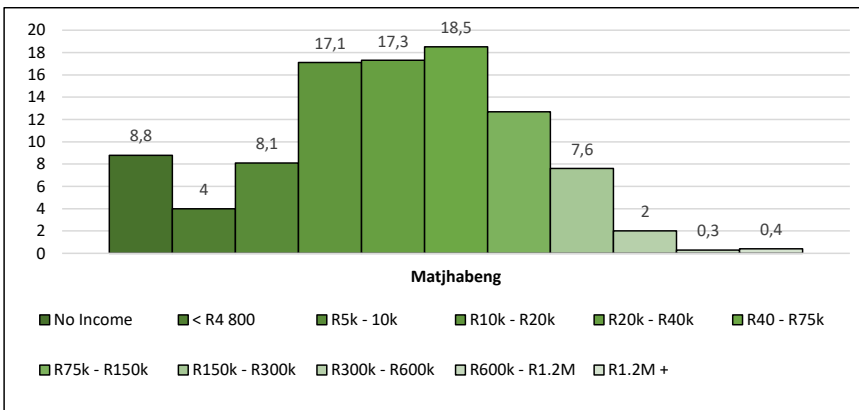


Figure 9: Percentages of the annual average household incomes for Matjhabeng Local Municipality (Statistics South Africa, 2011a).

In terms of housing, 83.5% of the households live in formal dwellings with 14.8% living in informal dwellings. 61.6% of households live in houses that were owned and fully paid off, while 14.2% of households rented (Statistics South Africa, 2016b).

Over the years there has been a significant increase in the number of households living in formal dwellings and equal decrease in the number of households living in informal dwellings. As can be seen in **Figure 10**, by 2016 MLM had fairly similar percentages of those living in formal and informal dwellings when compared with the district and province.

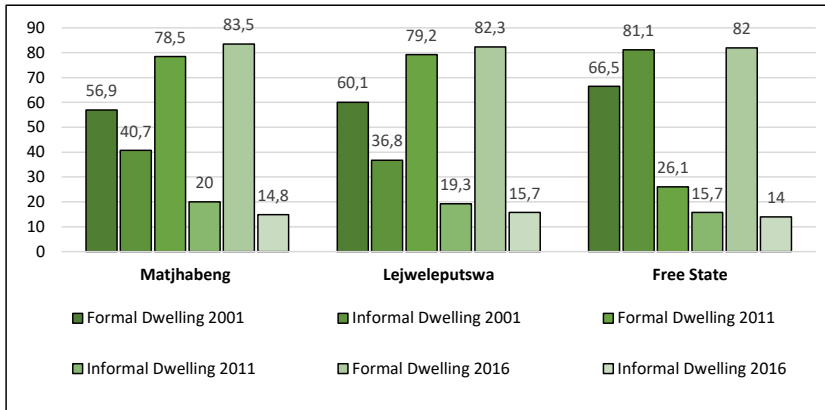


Figure 10: Household dwelling types for 2001, 2011 and 2016 (Statistics South Africa, 2016b, 2012).

Households have the right to certain basic services. Figure 11 shows the percentage of households with access to these basic services for MLM compared to the district and province. Piped water is supplied directly to 94.7% of the households, with 86.2% having flush toilets. 3% have no access to electricity. 74% of households receive regular refuse removal. The percentages of households with access to basic service delivery is higher for all basic service delivery indicators, than those of the district and province.

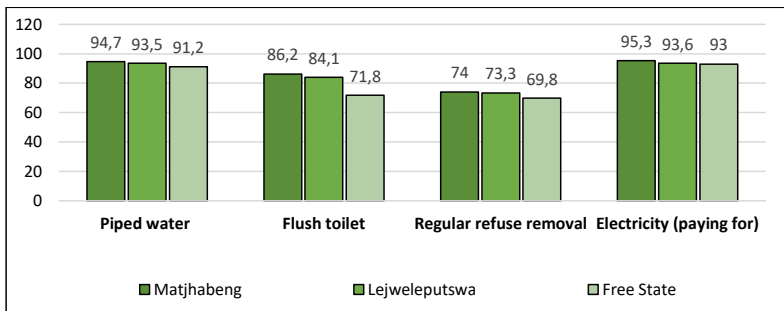


Figure 11: Access to household services (Statistics South Africa, 2016b).

Education Levels

Education is a crucial factor in creating widespread, meaningful employment opportunities and strengthening the municipality’s economy. Improving levels of education is critical for economic development, improving standards of living and reducing unemployment. The MLM generally had higher levels than those of the rest of the District and the Province, as indicated in Figure 12.

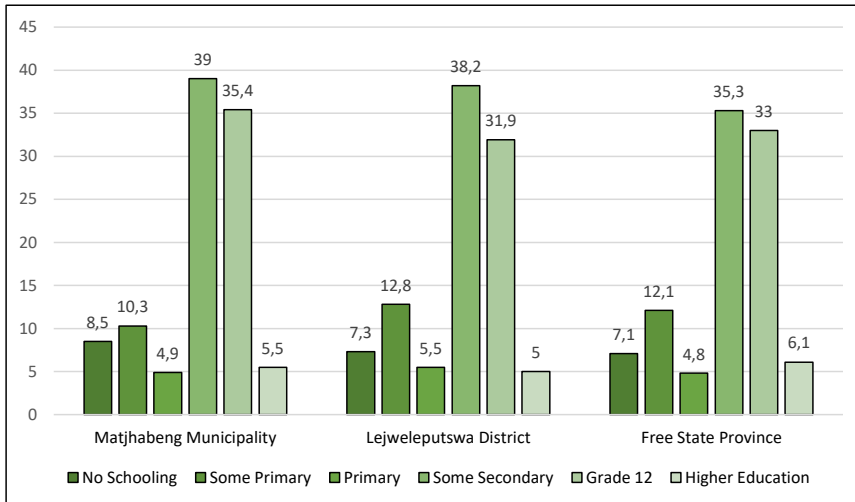


Figure 12: Level of education achieved for those over 20 years of age (Statistics South Africa, 2016b).

Unemployment

‘Economically active’ persons are defined as those that are either currently employed or actively seeking employment. Members of the population falling within the 15-64 years age bracket are classified as being of working age. MLM Municipality had a slightly higher unemployment rate, 21.2%, than both District Municipality, 19.9% and the Province, 17.5% (Statistic South Africa, 2011). Please note that these figures are based on the 2011 Census and current figures are likely to differ, particularly considering the impact of the COVID 19 Pandemic, thus these figures should only be used as a rough guide.

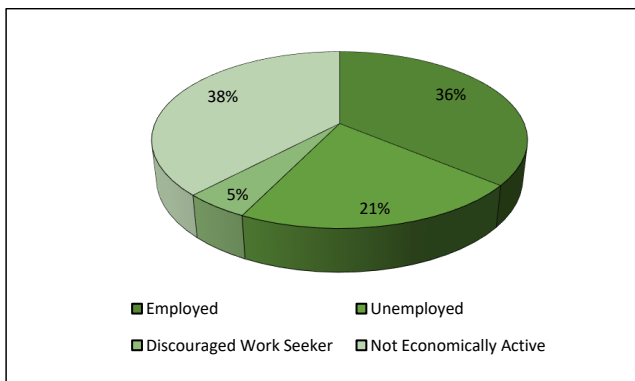


Figure 13: Employment status for Matjhabeng Local Municipality (Statistics South Africa, 2014)

Economic Contributors

The MLM is a predominantly rural municipality, with urban areas concentrated around the main town, Welkom. Known as the Gold Fields, the region’s major economic driver is gold mining. Welkom officially established in 1947, six years after the first mining lease in the area was awarded Welkom was proclaimed a town in 1948.

The MLM economy has the second highest production in the Free State and is hence a relatively important region in comparison to the wider economy. The MLM has a diverse economy, with three key production sectors, namely mining (37,9%), government (15,9%) and trade (14,7%). These sectors also support output in other industries including construction (2,4%), manufacturing (8%) and transportation (6,2%). Interesting to note, is that despite the region being predominantly rural in nature, the agriculture sector only accounts for 1,1% of the output (Myburgh and Bastile, 2019).

In a SWOT analysis done for the MLM (Myburgh and Bastile, 2019), the following weaknesses were identified:

- Demographics
 - o Declining household size with an increase in the number of households,
 - o A population growth rate slower than the provincial and national average,
 - o The number of child headed households,
- Housing and Basic Services
 - o Lack of access to adequate housing,
 - o Poor state of the roads,
 - o Lack of decent sanitation,
- Economy and employment
 - o Unemployment,
 - o Wasteful expenditure.

3.3.3 Ward 10, Matjhabeng Local Municipality

Portion 3 of the Farm Kopje Alleen No. 81 and Portion 9 of the Farm Commandants Pan No. 382 are situated within Ward 10 of Matjhabeng LM. Ward 10 had a population of 12 672 people and an area of 792.6km², with a density of 16 people per km². 60% of the population are between 18 and 64 years of age and 36% are younger than 18 years (Statistics South Africa, 2011b).

Population groups and languages

The black African population group make up the majority, 89%, of Ward 10's population. The white population group form 10% of the population and the coloured group 1%. Sesotho is the most widely spoken home language, 64%, followed by isiXhosa 14% (Statistics South Africa, 2011b).

Table 2: Languages spoken within Ward 10.

Sesotho	isiXhosa	Afrikaans	English	Setswana	Other
64%	14%	11%	3%	2%	4%

Households

There are 3 656 households within Ward 10, the majority of which are 'male-headed', 61%. Ward 10 had a similar percentage of households earning R10 000 or less, 27%, compared with the district, 28.5%, and province, 26.4%. The distribution of average annual household incomes in Ward 10 are depicted in **Figure 14**.

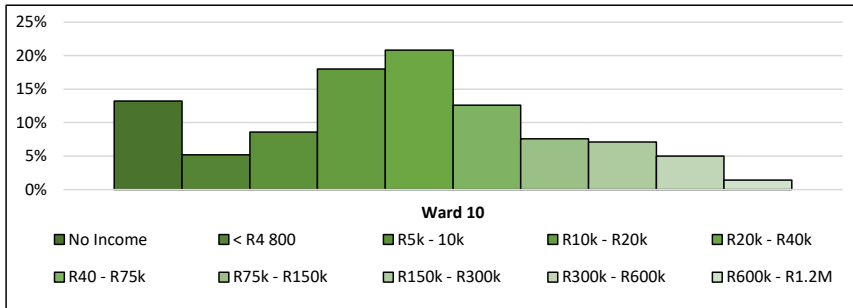


Figure 14: Average annual income for households in Ward 10 (Statistics South Africa, 2011b).

With regards to service delivery, 93% of households receive water via a service provider. 92.% of households had access to flush toilets and 90.8% had their refuse removed on a regular basis (Statistics South Africa, 2011b).

Education levels for those over 20 years of age in Ward 10 are higher than those of the district municipality, with 35% of people in the ward achieving matric of higher versus 31.8% for the district (Statistics South Africa, 2011b).

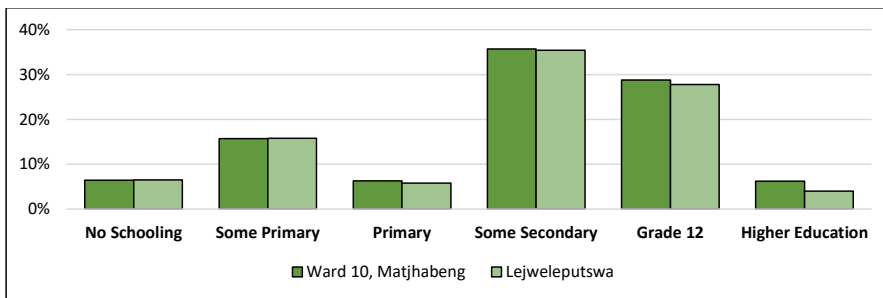


Figure 15: Education level achieved for those 20 years and older for Ward 10 compared with the rest of the district (Statistics South Africa, 2011b).

Based on the 2011 Census, Ward 10 had a much higher unemployment rate,27.2%, the rest of the District, 19.9%, and the Province, 17.5%, with a considerably smaller percentage of the population being not economically active, 32.1%, compared to the District, 39.8%, and the Province, 40.8%. See Figure 16.

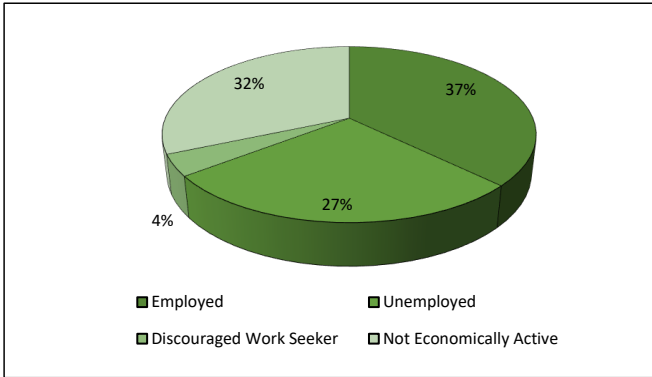


Figure 16: Employment status for Ward 10 (Statistics South Africa, 2011b)

4 CONSULTATION PROCESS

4.1 PUBLIC PARTICIPATION PROCESS FOLLOWED

In order to identify and understand potential social impacts, Interested and Affected Parties (I&APs) who were likely to be affected by the development were consulted. Prior to conducting a site inspection, landowner and surrounding landowners were notified of the proposed development and asked whether they wished to meet with the Enviroworks Specialists conducting the Social Impact Assessment. A site inspection was conducted between 24/05/2022 – 26/05/2022. During the site inspection, the Specialist Team met with various I&APs and Organs of State and travelled around the area to gain an idea of the area’s sense place and social dynamics. A 30 day Public Participation Process (PPP) was conducted between 18/08/2022 and 16/09/2022. A second PPP was conducted on a Revised Scoping Report between 12/10/2022 and 11/11/2022. As part of the Public Participation Process, various I&APs and Organs of State were notified of the development proposal and the opportunity to provide comment. A list of the I&APs and Organs of State notified can be found in Appendix 3.

All comments received during the site inspection engagement, telephonic and email correspondence before and after the site inspection and comments received during the 30 day PPP were considered in assessing the potential social impacts.

Table 3: Consultation conducted by Enviroworks.

Interested and Affected Parties	Comments received
Surrounding Landowner - Farm Dankbaarheid No. 244	Has been developing a game/hunting farm as part of retirement plan, and the proposed solar facility will be visible from the farm and there will be an influx of people. If the solar facility is developed it will detract from the areas sense of place and the farm will not be financially viable because clients, in particular overseas clients, do not want to see industrial infrastructure when they are hunting/on safari. There will also be increased noise and activity in the area if the solar facility is

	developed. Noted that the developer should buy his property if the development goes ahead.
Landowner - Portion 9 of Commandants Pan No. 382, Portion 12 of Nooitgedacht No.74, Tafel Baai No. 413	Discussed the routing of the powerline through the farm. Raised fire as a concern with regards to the powerlines.
Surrounding Landowner - Portion 1 of Klein Koppie Alleen No. 182	Raised concerns regarding the routing of the powerline through the farm in terms of it going through fields and the fire risk it created.
Surrounding Landowner - Commandants Pan No. 424, Portion 1 of Commandants Pan No. 424)	<p>The gravel access roads are already in a poor condition and will be a challenge for trucks accessing the site.</p> <p>Noted that safety is a concern during construction:</p> <ul style="list-style-type: none"> - There will be new people in the area, that now 'know' the area. - How will employees be identified. - Where will workers stay. - New access roads will be created, which could be utilised by criminals. - Mentioned livestock theft. <p>Has a proclaimed gravel pit on farm that can be utilised for road maintenance.</p>
Nearby Landowner where powerline may traverse - Portion 1 of De Hoop No. 276, Portion 1 of Elsinore No. 12	Emphasised that they did not want powerlines traversing through their land as this obstructs their farming activities.
Nearby Landowner where powerline may traverse - Portion 1 of Mimosa No. 334)	No concerns raised.
Department of Mineral Resources and Energy	Advised that a Section 53 application must be submitted to confirm whether or not the proposed development will affect current or future mining activities.

5 KEY SOCIAL ISSUES

The social variables considered for the proposed amendment are grouped into seven main categories, in accordance with Vanclay's list of social impact variables (Vanclay, 2003; Wong, 2013). The seven categories are as follows:

1. Health and social well-being impacts
2. Quality of the living environment impacts
3. Economic impacts and material well-being impacts
4. Cultural impacts
5. Family and community impacts
6. Institutional, legal, political and equity impacts
7. Gender relations impacts.

The categories listed above may, at times, overlap as certain impacts may affect more than one category. Significant impacts are expected to occur during all phases of the project, namely construction, operation and decommissioning, although the majority of impacts are anticipated to occur during the construction phase. The seven categories will now be discussed as they apply to the proposed solar facility development as a whole.

5.1 HEALTH AND SOCIAL WELLBEING RELATED IMPACTS

The health and social wellbeing impacts related to the proposed solar facility development include:

- Increased noise
- Potential increase in crime/fear of increased crime
- Health implications
- Loss of sense of place/visual impact

5.1.1 Increased noise

The increase in noise is primarily restricted to the Construction Phase. Noise, uncharacteristic of the agricultural landscape, will be generated while the solar facility is being constructed. Activities generating noise would include the movement of construction vehicles to, from and on site, personnel, concrete mixing, generators and other noises typically associated with construction. Given the rural nature of the receiving environment, an increase in noise is likely to be noticed more than it might elsewhere. Noise, not characteristic to the area affects the sense of place and creates a disturbance.

5.1.2 Potential increase in crime/fear of increased crime

Farmers within rural landscapes are particularly vulnerable to crime because of their remoteness and distance from neighbouring farmsteads. With an influx of construction workers frequenting the construction site, the surrounding communities are highly likely to fear an increase in crime in the area and experience hyperawareness. This will likely have a psychological effect on some of the people living in the surrounding area, who will feel their safety is at risk. Knowledge of project may lead to an influx of people either seeking employment opportunities (who may turn to crime if unsuccessful) or persons with criminal intent. Once the Construction Phase is complete the number of construction personnel frequenting the site will be significantly reduced, with only maintenance activities taking place. Once operational, the fear will likely subside.

5.1.3 Health implications

As mentioned, the Free State has a slightly higher HIV prevalence than the national average. With the work force residing in the area as well as a potential influx of job seekers, the possibility for the spread of HIV/AIDS is increased during the Construction Phase. With plant and machinery used on construction sites, there is significant risk of injury or death to construction workers. An increase in the number of vehicles using farm roads, coupled with potential reckless driving, may lead to vehicle accidents. Dust generated as a result of construction activities can potentially cause health problems such as silicosis. These impacts will be able to be mitigated, for the most part, through information sessions and dust suppression measures.

5.1.4 Loss of sense of place/visual impact

The proposed development site is rural/agricultural in nature. The vegetation structure predominantly consists of low grasses and the site has a very flat topography. The development of a solar facility will

generate noise and activity uncharacteristic to the receiving environment during construction. Lighting would be installed at the facility. The infrastructure (battery energy storage system (BESS) containers and solar panels) will have a height of 6-8m. The solar facility will be visible and is likely to detract from the area's rural sense of place. Loss of sense of place is predominantly expected to occur during the Construction Phase, when noise and visual impacts will be generated. Once operational, the main impact would be the visual intrusion of the solar facility. These impacts would predominantly be experienced by surrounding landowners.

5.2 QUALITY OF THE LIVING ENVIRONMENT IMPACTS

Impacts associated with the quality of the living environment include:

- Disruption of daily living
- Loss of the area's sense of place
- Increased demand on existing infrastructure
- Improvement of national electricity supply

5.2.1 Disruption of daily living

An increase in noise generated during construction and activity on the roads will disturb those living and working in the area. Increased traffic on the access road could interfere with farming activities. If activities generate excessive dust, nuisance and potential health impacts may occur.

5.2.2 Loss of sense of place

As described in 5.15, The proposed development site is rural/agricultural in nature, with a topography and vegetation structure which does not offer much visual screening. During the Construction Phase, noise and activity uncharacteristic to the receiving environment will be created. People who live in the area particularly for its rural feel will likely experience a reduced quality of their living environment. Loss of sense of place is predominantly expected to occur during the construction phase, when noise and visual impacts will be generated. Once operational, the main impact would be the visual intrusion of the solar facility. These impacts would predominantly be experienced by surrounding landowners.

5.2.3 Increased demand on existing infrastructure

Road infrastructure in the Free State and the area surrounding the proposed development site is poorly maintained and deteriorating. Increased vehicular traffic, particularly construction vehicles, will place increased pressure on road infrastructure. Gravel access roads to the proposed development site are particularly susceptible and are also utilised by several local farmers. Mitigation measures will need to be put in place to ensure that at least gravel access roads are adequately maintained.

5.2.4 Improvement of national and/or municipal electricity supply

South Africa is experiencing an electricity supply shortage. The proposed development will have a maximum electricity generation capacity of 110MW. Electricity generated will be discharged into the national grid, or potentially bought by the local municipality. This will assist in alleviating the municipal and/or national electricity shortages. Since the electricity will first be discharged into either the municipal or national grid, the immediate surrounding areas, such as Riebeeckstad, will not necessarily benefit directly from the electricity generation (i.e. decreased loadshedding).

5.3 ECONOMIC AND MATERIAL WELLBEING IMPACTS (NEGATIVE)

Negative economic and material wellbeing impacts associated with the proposed solar facility development include:

- Decreased tourism potential for the surrounding area
- Livestock theft

5.3.1 Decreased tourism potential for the surrounding area

Disturbances to the area's sense of place is likely to decrease the area's potential for tourism activities which rely on the rural feel characteristic to the receiving environment. Game farming is one of the activities within the surrounding area. Wildlife resorts and hunting farms rely on a 'rural feel' (i.e. being completely removed from the city) and industrial infrastructure is counter to this. If the sense of place is affected, the marketability of surrounding game farms as safari and/or hunting destinations, particularly to overseas clients, will be significantly impacted, resulting in potential income and job losses. A game farm is being developed on the farm north of the proposed facility, on Farm Dankbaarheid No. 244, and there is an existing game farm on the farm Newlands No. 42, approximately 3.5km west of the proposed facility. Environmentally sensitive areas, such as the Commandants Pan, will be avoided and their ability to serve as tourist attractions (for example birding) is not anticipated to be impacted.

5.3.2 Livestock theft

With construction, there will be a significant number of 'new' people frequenting the area, including employed construction workers and potentially work seekers. Access will be created to areas not previously accessible. This influx of people may lead to increased crime, in particular livestock theft, which will cause significant income losses for farmers. This would have a direct loss of income due to stolen livestock and farmers may also need to invest more money into security measures.

5.4 ECONOMIC AND MATERIAL WELL BEING IMPACTS (POSITIVE)

Positive economic and material benefits associated with the proposed solar facility development include:

- Creation of employment opportunities
- Knock-on effects for local business
- Financial benefit for landowners

5.4.1 Creation of employment opportunities

The development of the proposed solar facility will create new job opportunities. An estimated 333 full time equivalent (FTE) contract jobs will be created during the Construction Phase and an estimated 15 to 20 FTE jobs will be created during the operational phase (WKN-Windcurrent, 2022). The facility has an estimated lifespan of 25 years, with a likelihood of it being refurbished to extend its lifespan. The jobs created will result in a direct positive impact for those employed. Given the technical nature of the proposed development, a number of the employment positions will need to be filled by skilled workers, which may not be available within the municipality, requiring the hiring of outside personnel.

5.4.2 Knock-on effects for local business

Particularly during the Construction Phase, money will be spent on local goods and services, including construction materials, accommodation, food etc., resulting in significant positive economic effects

for the local economy. By utilising local service providers as far as possible, the magnitude of this positive impact can be increased.

5.4.3 Financial benefit for the landowners

The landowners of Portion 9 of the Farm Commandants Pan No. 382, the Farm Tafel Baai No. 413 and Portion 12 of the Farm Nooitgedacht No. 74 will directly benefit from the income generated by hiring their land to the Applicant. The income generated will outweigh the income potential of continuing to be use the land for its current use. yellow

5.5 CULTURAL IMPACTS

The proposed solar facility development is not anticipated to have significant cultural impacts. The Heritage Study conducted for the proposed development found the cultural landscape to hold low heritage significance (Kaplan, 2022). Most of the workforce is anticipated to be South African, thus there are no potential cultural shifts or conflicts anticipated. Considering this and the low heritage significance of the site, no cultural impacts have been assessed.

5.6 FAMILY AND COMMUNITY IMPACTS

The proposed solar facility development is not expected to influence the surrounding area at a family and community level, but potential impacts are likely to include:

- Potential increase in crime/fear of increased crime
- Decreased level of satisfaction with the living environment (Relocation of farmers and residents)

5.6.1 Potential increase in crime/fear of increased crime

As already discussed in 5.2.3, the proposed solar facility development could lead to an increase in crime and/or an increased fear of potential crime. Families and community will be directly impacted if an increase in crime occurs, and impacts would be very high in the case of violent crimes. The fear of potential crime may alter the daily lives of families and community, for example being afraid to drive farm roads a night, and lead to increased stress among community members This impact is primarily expected to be experienced during the construction phase.

5.6.2 Relocation of farmers and residents

If significant impacts in terms of loss of sense of place and increased crime are realised, famers and residents will experience a dissatisfaction with the living environment and in extreme cases residents might consider re-locating. This will alter family and community level dynamics. The potential of this occurring is low and as such has not been assessed in detail.

5.7 INSTITUTIONAL, LEGAL, POLITICAL AND EQUITY IMPACTS

Institutional, legal, political and equity impacts associated with the proposed solar facility development include the following:

- Alignment with national, provincial and local planning

5.7.1 Alignment with national, provincial and local planning

Misalignment with national, provincial and local government planning would lead to conflicts with future planned developments and land uses. Positive impacts include contributing to the realisation of the goals of various planning documents, including job creation and the development of more renewable energy sources (White Paper on the Renewable Energy Policy of RSA 2003). Corridors for Electricity Grid Infrastructure (EGI) were gazetted on 16 February 2018 in Government Gazette 41445, Government Notice R.113. These corridors are the preferred area for development of future EGI. The Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) also needs to be noted. The programme is aimed at supplying additional electricity to the country through private sector investment in renewable energy projects, including solar, wind, biomass and small hydro.

5.8 GENDER RELATIONS

Gender refers to the characteristics that society attributes to males and females. These characteristics vary greatly between different cultures and will tend to change over time. Culture thus plays an important role on gender relations along with other factors such as the gender of the household head.

With regards to the proposed amendment, no impacts are expected to affect gender relations. Thus, no aspects with regards to gender have been assessed.

6 ASSESSMENT OF IMPACTS

This Section presents the findings of the social impact assessment components and activities associated with the proposed solar facility development.

The No-Go Option has been included in the assessment. Should the No-Go Option be opted for, it would result in the solar facility not being developed and the proposed development site would continue to be used for its current use, i.e. agriculture.

Social impacts have been grouped according to the seven categories and assessed for the Construction and Operational Phases. Mitigation measures are recommended in order to reduce or eliminate negative impacts and to enhance positive impacts. Impacts occurring during the Decommissioning Phase will be fairly similar to the Construction Phase. As such, impacts have only been discussed for the Decommissioning Phase but not assessed in detail.

The methodology used for assessing impacts can be found in **Appendix 1**.

6.1 SOCIAL IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE

Most impacts are anticipated to occur during the Construction Phase, when the number of personnel and activities on site will be greater. During the Construction Phase roads will be developed, the site would need to be cleared, boundary fencing will be erected, infrastructure would be delivered to site and installed, and a substation constructed. Other than security personnel, no construction personnel are expected to remain on site overnight. Other activities associated with the Construction Phase include advertising for the new jobs available. This advertising process may lead to an influx of work seekers and possibly an increase in crime.

The social categories assessed include:

1. Health and social well-being impacts

2. Quality of the living environment impacts
3. Economic impacts and material well-being impacts
4. Family and community impacts

6.1.1 Health and social wellbeing related impacts

The following health and social well-being impacts, relating to the Construction Phase, were assessed:

- Increased noise
- Increased dust
- Potential increase in crime/fear of increased crime
- Health implications
- Loss of sense of place/visual impact (assessed in 6.1.2)

Increased noise

Impact: Excessive noise from construction vehicles, construction activities and personnel.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	8	4
Duration	2	2
Extent	2	2
Irreplaceable loss of resources	2	2
Reversibility	2	2
Probability	3	3
Total Significance Points	48	36
Significance rating	M	L
Cumulative Impact	M	L
Mitigation measures:	<ul style="list-style-type: none"> • Construction works must be restricted to usual work hours, 07:00 – 18:00, Monday to Saturday. No work on Sundays and public holidays. • Delivery of construction material and components must be restricted to the usual work hours. • A Code of Conduct must be drawn up and personnel must adhere to the code. • As far as possible, noisy activities must be screened. • A Complaints Register must be maintained and measures to address complaints must be implemented timeously. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then the proposed development site will continue to be used for agricultural activities and there will be no increase in noise experienced.

Potential increase in crime and/or fear of an increase in crime

Impact: Construction personnel may take part in criminal activities and/or the activity in the area may draw other criminals to the area. Farmsteads are particularly vulnerable to crime.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	10	10
Duration	2	2
Extent	2	2
Irreplaceable loss of resources	4	2
Reversibility	4	2
Probability	3	2
Total Significance Points	66	36
Significance rating	M	L
Cumulative Impact	M	M
Mitigation measures:	<ul style="list-style-type: none"> • The recruitment process should be conducted at the expected source of local laborers, in order to avoid a potential influx of work seekers to the area immediately surrounding the solar facility. • Contractors to strictly monitor for any non-employees on site and to report any immediately. • All employees are required to have a form of identification. • No farm gates to be left open. • Farmers to report cases of livestock theft to the Contractor to investigate internally. • The Applicant and Contractors to work closely with farm watch groups. • No construction personnel to be accessing or leaving the construction site before 05:00 or after 20:00. • Apart from security personnel, no construction staff are to remain on site overnight. All personnel are to be housed offsite. • Sufficient security staff must be placed at the solar facility during all phases of the proposed development 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then the proposed development site will continue to be used for agricultural activities and there will be no increase in crime as a result of the solar facility. Residents in the area would not fear a potential increase in crime. Crime levels may still alter, but this would be due to other factors.

Health implications

Impact: Dangerous conditions created by construction activities and increased vehicles using access roads, leading to accidents. An influx of workers/work seekers may increase the spread of HIV/AIDS.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	8	8
Duration	2	2
Extent	3	3
Irreplaceable loss of resources	4	2
Reversibility	4	2
Probability	3	2
Total Significance Points	63	34
Significance rating	M	L
Cumulative Impact	L	L
Mitigation measures:	<ul style="list-style-type: none"> • Monitor dust levels and ensure dust mitigation measures are in place. • All employees to be supplied with appropriate PPE. • Speed limits must be enforced on access roads. • As far as possible, employment positions should be filled by local persons residing in the area. • HIV/AIDS awareness talks to be incorporated into induction talks. • No non-employees to be allowed on the construction site/construction camp. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will not be any potential health hazards created (dust, traffic, dangerous activities) and there will be no influx of work seekers to the area. Potential negative health impacts will not be realised.

6.1.2 Quality of the living environment impacts

The following living environment impacts, relating to the Construction Phase, were assessed:

- Disruption of daily living
- Loss of the area's sense of place
- Increased demand on existing infrastructure

Disruption of daily living

Impact: Increased noise, increased traffic on roads, increased dust and interference with farming activities.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	8	6
Duration	2	2
Extent	1	1
Irreplaceable loss of resources	2	2

Reversibility	3	2
Probability	3	2
Total Significance Points	48	26
Significance rating	M	L
Cumulative Impact	M	L
Mitigation measures:	<ul style="list-style-type: none"> The Applicant and their appointed contractors must maintain good communication channels with the farmers in the surrounding area and notify them timeously if any activities will take place which may disrupt the farmers' daily activities. Access roads must not be blocked. The Applicant should contribute towards the maintenance of public access roads, in particular the gravel roads. The Applicant's responsibilities with regard to road maintenance must be confirmed prior to construction commencing. Construction works must be restricted to usual work hours, 07:00 – 18:00, Monday to Saturday. No work on Sundays and public holidays. Delivery of construction material and components must be restricted to the usual work hours. A Code of Conduct must be drawn up and personnel must adhere to the code. A Complaints Register must be maintained and measures to address complaints must be implemented timeously. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will be no activities taking place which would disrupt daily living. The site would continue to be used for agricultural activities.

Loss of sense of place/visual impact

Impact: Temporary impact on area's rural sense of place, due to increase noise and activities.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	8	4
Duration	2	2
Extent	1	1
Irreplaceable loss of resources	2	2
Reversibility	3	2
Probability	4	3
Total Significance Points	64	33
Significance rating	M	L
Cumulative Impact	M	M
Mitigation measures:	<ul style="list-style-type: none"> Notify residents prior to conducting activities that may cause excessive noise. Use attenuation for machinery and screen noisy activities where possible. 	

	<ul style="list-style-type: none"> • Construction works must be restricted to usual work hours, 07:00 – 18:00, Monday to Saturday. No work on Sundays and public holidays. • Delivery of construction material and components must be restricted to the usual work hours. • A Code of Conduct must be drawn up and personnel must adhere to the code. • A Complaints Register must be maintained and measures to address complaints must be implemented timeously. • Limit the amount of lighting on site to what is necessary. • Retain natural vegetation wherever possible. • The recommendations of the Visual Impact Assessment must be implemented.
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Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will be no activities taking place which would create noise and visual intrusion that would alter the area's sense of place. The site would continue to be used for agriculture and potential impacts to the area's sense of place would not be realised.

Increased demand on existing infrastructure

Impact: Additional construction vehicles using the roads to access the site will cause additional wear and tear on road infrastructure already in a poor state.

Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	8	6
Duration	2	2
Extent	3	3
Irreplaceable loss of resources	3	3
Reversibility	3	2
Probability	2	2
Total Significance Points	38	32
Significance rating	L	L
Cumulative Impact	M	L
Mitigation measures:	<ul style="list-style-type: none"> • The Applicant must draw up and agreement with local farmers and the municipality for the maintenance of gravel access roads and contribute to the maintenance of the roads as per the agreement. • The Applicant should consider contributing to the maintenance of tarred roads, in collaboration with the local municipality. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will be no additional vehicles using the tar and gravel roads in the area. Roads will not be damaged as a result of the solar facility being constructed.

6.1.3 Economic impacts and material well-being impacts (negative and positive)

The economic impacts and material well-being impacts, relating to the Construction Phase, assessed include:

- Livestock theft
- Creation of employment opportunities
- Knock-on effects for local business

Livestock theft

Impact: Construction activities in the area may directly and/or indirectly increase livestock theft, which can cause significant economic losses for farmers.

Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	8	6
Duration	2	2
Extent	2	2
Irreplaceable loss of resources	3	2
Reversibility	3	2
Probability	3	2
Total Significance Points	54	28
Significance rating	M	L
Cumulative Impact	M	L
Mitigation measures:	<ul style="list-style-type: none"> • The recruitment process should be conducted at the expected source of local laborers, in order to avoid a potential influx of work seekers to the area immediately surrounding the mine. • Contractors to strictly monitor for any non-employees on site and to report any immediately. • All employees are required to have a form of identification. • No farm gates to be left open. • Farmers to report cases of livestock theft to the Contractor to investigate internally. If it can be proved that particular instances of livestock theft were a direct result of the construction activities on the solar facility farmers must be compensated. • The Applicant and Contractors to work closely with farm watch groups. • No construction personnel to be accessing or leaving the construction site before 05:00 or after 20:00. • Apart from security personnel, no construction staff are to remain on site overnight. All personnel are to be housed offsite. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will be no increase, or decrease, in livestock theft as a result of construction activities on the solar facility.

Creation of employment opportunities

Impact: During the Construction Phase of the solar facility, an estimated 333 contract (i.e. temporary) employment positions will be created. Some of these positions would be filled by locals.

Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Enhancement	After Enhancement
Magnitude	6	8
Duration	2	2
Extent	2	2
Irreplaceable loss of resources	0	0
Reversibility	5	5
Probability	4	4
Total Significance Points	60	68
Significance rating	M (+)	M (+)
Cumulative Impact	L (+)	L (+)
Mitigation measures:	<ul style="list-style-type: none"> As far possible, fill employment positions with local personnel from the surrounding areas. If there is a deficit of locals who are sufficiently skilled, the Applicant should endeavour to provide training for locals to fill the positions. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then no new jobs will be created, and the potential positive impacts will not be realised. Skilled and unskilled people in the area, who may have applied for the positions, would continue to be unemployed or need to seek work elsewhere.

Knock-on effects for local business

Impact: Money spent on local goods and services by the Applicant and their appointed contractors during the construction phase.

Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Enhancement	After Enhancement
Magnitude	8	10
Duration	3	3
Extent	3	3
Irreplaceable loss of resources	0	0
Reversibility	5	5
Probability	4	5
Total Significance Points	76	105
Significance rating	M (+)	H (+)
Cumulative Impact	L (+)	L (+)
Mitigation measures:	<ul style="list-style-type: none"> As far as possible, the developer and Contractor must make use of local service providers for building materials, accommodation, food and services. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will be no construction activities taking place, and there will be no need for the Applicant to purchase local goods and services. Potential positive economic impacts would not be realised.

6.1.4 Family and community impacts

The family and community impacts, relating to the Construction Phase, assessed include:

- Potential increase in crime and/or fear of increased crime.

Impacts to the crime levels have been assessed in 6.1.1.

6.2 SOCIAL IMPACTS ASSOCIATED WITH THE OPERATIONAL PHASE

Once constructed, activities at the proposed solar facility will be reduced to daily operational and maintenance activities. The facility will have a maximum electrical generation capacity of 110MW, which will be discharged into the local or national grid.

The social categories assessed include:

1. Quality of the living environment impacts
2. Economic impacts and material well-being impacts (positive and negative)
3. Family and community impacts
4. Institutional, legal, political and equity impacts

6.2.1 Quality of the living environment impacts

The following quality of the living environment impacts, relating to the Operational Phase, were assessed:

- Loss of the area's sense of place/visual impact
- Improvement of national electricity supply

Loss of the area's sense of place/visual impact

Impact: Loss of sense of place and visual impact of the solar facility will detract from the area's rural feel.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	8	6
Duration	3	3
Extent	2	2
Irreplaceable loss of resources	3	3
Reversibility	3	3
Probability	3	2
Total Significance Points	57	34
Significance rating	M	L
Cumulative Impact	MH	M
Mitigation measures:	<ul style="list-style-type: none"> • Retain as much natural vegetation as possible on the site, particularly along the site boundaries. • Infrastructure should be screened by planting additional trees around the boundary of the solar facility. 	

	<ul style="list-style-type: none"> Buildings and infrastructure must be painted matt colours that blend into the surrounding environment. Mitigation measures described in the Visual Impact Assessment must be implemented.
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Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will be no permanent infrastructure creating a visual impact and detracting from the areas sense of place. The sense of place will remain as it is currently, i.e rural agricultural land.

Improvement of national electricity supply

Impact: Addition of 110MW generation capacity contributing to the municipal or national electricity supply.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Enhancement	After Enhancement
Magnitude	5	N/A
Duration	3	
Extent	3	
Irreplaceable loss of resources	0	
Reversibility	4	
Probability	5	
Total Significance Points	75	
Significance rating	M (+)	
Cumulative Impact	M (+)	
Mitigation measures:	<ul style="list-style-type: none"> Electricity should preferably be bought by the local municipality so that it can be supplied the communities surrounding the solar facility. This is however outside of the Applicants control. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then an additional 110MW of generation capacity will not be created. There will be no additional electricity supplied to the municipal and/or national power grid and no contribution to resolving the national electricity shortage.

6.2.2 Economic and material well-being impacts (negative and positive)

The positive and negative economic and material well-being impacts, relating to the Operational Phase, assessed include:

- Decreased tourism potential for the surrounding area
- Creation of employment opportunities
- Knock-on effects for local business
- Financial benefit for landowners

Decreased tourism potential for the surrounding area

Impact: Loss of sense of place will compromise the economic viability of tourism operations in the surrounding area. A planned game and hunting farm will likely no longer be economically viable.

Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	6	5
Duration	3	3
Extent	2	2
Irreplaceable loss of resources	2	2
Reversibility	3	3
Probability	3	2
Total Significance Points	48	30
Significance rating	M	L
Cumulative Impact	M	M
Mitigation measures:	<ul style="list-style-type: none"> Implicate mitigation measures to reduce the visual impact by the solar facility as much as possible. Activities and personnel on site must be managed in a way that ensures minimal noise is generated during daily operation. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will be no infrastructure built on the site which could detract from the sense of place of surrounding areas. The site would continue to be used for its current use, i.e. agriculture, and there would be no impacts to the 'sense of place' of the existing and game/hunting farms to the west and north of the proposed development site.

Creation of employment opportunities

Impact: Creation of approximately 15 to 20 full time equivalent (FTE) employment positions annually, for 20 years or for the operational lifetime of the facility if extended beyond 20 years. Some of these positions will be filled by locals.

Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Enhancement	After Enhancement
Magnitude	6	8
Duration	3	3
Extent	2	2
Irreplaceable loss of resources	0	0
Reversibility	4	4
Probability	4	4
Total Significance Points	60	68
Significance rating	M (+)	M (+)
Cumulative Impact	L (+)	L (+)
Mitigation measures:	<ul style="list-style-type: none"> As far possible employ local personnel from the surrounding areas. If there is a deficit of locals who are sufficiently skilled, the Applicant should endeavour to provide training for locals to fill the positions. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then no new jobs will be created, and the potential positive impacts will not be realised. Skilled and unskilled people in the area, who may have applied for the positions, would continue to be unemployed or need to seek work elsewhere.

Knock-on effects for local business

Impact: Money spent on local goods and services by the Applicant and their appointed contractors.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Enhancement	After Enhancement
Magnitude	3	5
Duration	3	3
Extent	3	3
Irreplaceable loss of resources	0	0
Reversibility	0	0
Probability	2	3
Total Significance Points	18	33
Significance rating	L (+)	L (+)
Cumulative Impact	L (+)	L (+)
Mitigation measures:	<ul style="list-style-type: none"> As far as possible, the developer and Contractor must make use of local service providers for building materials, accommodation, food and services. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will be no need for the Applicant to purchase local goods and services during the Operational Phase and no contractors working in the area who would spend money on local goods and services. Potential positive economic impacts would not be realised.

Financial benefit for landowners

Impact: Landowners will receive additional income from renting out their land for the solar facility. The income received will be more than if the land were to continue to be used for agricultural activities.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Enhancement	After Enhancement
Magnitude	4	N/A
Duration	3	
Extent	1	
Irreplaceable loss of resources	0	
Reversibility	0	
Probability	5	
Total Significance Points	40	
Significance rating	M (+)	
Cumulative Impact	L (+)	
Mitigation measures:	<ul style="list-style-type: none"> No enhancement measures are applicable. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then the landowners will not receive no financial benefit from renting out their land. The landowners would continue to generate income from the land through agricultural activities.

6.2.3 Family and community impacts

The proposed solar facility is unlikely to affect the surrounding area at a family level but will lead to negative impacts among the surrounding communities. These impacts are likely to include:

- Decreased level of satisfaction with the living environment

Decreased level of satisfaction with the living environment

Impact: Increased activity and visual impacts may lead to a decreased level of satisfaction with the living environment for farmers and residents in the area.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Mitigation	After Mitigation
Magnitude	7	5
Duration	3	3
Extent	1	1
Irreplaceable loss of resources	3	3
Reversibility	4	3
Probability	3	2
Total Significance Points	54	30
Significance rating	M	L
Cumulative Impact	MH	M
Mitigation measures:	<ul style="list-style-type: none"> • Implicate mitigation measures to reduce the visual impact by the solar facility as much as possible. • Maintenance works must be restricted to usual work hours, 07:00 – 18:00, Monday to Saturday. No work on Sundays and public holidays, apart from emergency maintenance. • A Code of Conduct must be drawn up and personnel must adhere to the code. Activities and personnel on site must be managed in a way that ensures minimal noise is generated during daily operation. • A Complaints Register must be maintained and measures to address complaints must be implemented timeously. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, then there will be no infrastructure built on the site which could detract from the sense of place of surrounding areas and there will be no new operational activities taking place in the area. The site would be continued to be used for its current use, i.e. agriculture, and there would be no new impacts to farmers and residents' daily lives.

6.2.4 Institutional, legal, political and equity impacts

The institutional, legal, political and equity impacts, relating to the Operational Phase, assessed include:

- Alignment with national, provincial and local planning

Alignment with national, provincial and local planning

Impact: The proposed development will contribute to South Africa achieving its renewable energy goals.		
Nature of Impact	Preferred Alternative (Alternative 1)	
	Before Enhancement	After Enhancement
Magnitude	6	N/A
Duration	3	
Extent	4	
Irreplaceable loss of resources	0	
Reversibility	0	
Probability	5	
Total Significance Points	65	
Significance rating	M (+)	
Cumulative Impact	M (+)	
Mitigation measures:	<ul style="list-style-type: none"> • Ensure that the development of the proposed solar facility does not compromise on the goals of other national, provincial and local planning documents. • Electricity must first be used within the Free State Province, as stipulated in the Free State Provincial Spatial Development Framework. 	

Assessment of the No-Go Option

If the proposed solar facility is not developed, an opportunity to contribute to a shift in electricity production to renewable energy sources will not be realised. The facility, or similar, will need to be developed elsewhere if the goals of the White Paper on the Renewable Energy Policy of RSA 2003 are to be achieved.

6.3 SOCIAL IMPACTS ASSOCIATED WITH THE DECOMMISSIONING PHASE

The solar facility will have an estimated lifespan of approximately 25 years, after which the facility will either need to be upgraded to extend its lifespan or it will be decommissioned. Decommissioning would involve removing all the infrastructure on site and rehabilitating the land to its previous condition.

Similar impacts as those assessed for the Construction Phase are expected to occur during the Decommissioning Phase. Once decommissioned, the Operational Phase impacts would cease. A key positive impact following decommissioning is the removal of visually intrusive infrastructure. Assuming that land uses on surrounding farms remains the same and that the site is rehabilitated, the site and surrounds would regain their current sense of place, i.e. rural/agricultural.

The No-Go option of not decommissioning the facility would result in no change from the Operational Phase impacts.

7 KEY FINDINGS AND RECOMMENDATIONS

The key findings and recommendations of the study are listed here and are based on:

1. A review of issues identified from comments received during the Public Participation Assessment Process.
2. A review of relevant key policy and planning documents.
3. Interviews with I&APs.
4. A review of relevant literature on social impacts.
5. The experience of the authors with other SIAs which are relevant to the proposed project.

7.1 SUMMARY OF KEY FINDINGS

7.1.1 Policy and planning issues

A brief summary of the key documents, reviewed in Section 2 “Policy and Planning Environment”, is provided below, to explain the main aims of the different Policy documents reviewed during this study:

- The National Development Plan (NDP) (2011) contains a plan aimed at eliminating poverty and reducing inequality by 2030 making this one of the guiding objectives of the NDP over the next 20 years.
- The White Paper on Renewable Energy supports the development of South Africa’s renewable energy sector in order to reduce greenhouse gas emissions.
- The Free State PSDF aims to address the key challenges facing the Free State of needing to implement a ‘developmental state’ while ensuring global obligations to social, economic and environmental sustainability are achieved.
- The Lejweleputswa District Municipality: Integrated Development Plan 2017-2022 identified development needs and aims to guide development within the District. It identifies the development of solar power plant as a strategic objective and the south-western part of the district has been identified for a potential solar energy hub. The district has seen retrenchments in the mining industry.
- Within the Local Municipality: Integrated Development Plan for The Financial Year 2017 – 2022 it is noted that the Matjhabeng area has a well-established bulk electrical network. The municipality however faces the challenge of aging electrical infrastructure. The Municipality is endeavoring to reduce their carbon footprint and move towards a green economy.

Within the NDP job creation is noted as an important factor for future development. As shown by the Economic Impact Assessment Report done for the proposed solar facility (van Jaarsveld, 2022), the proposed development will create additional jobs and generate income for the local economy. Some potential jobs may be lost due to impacts to the sense of place (for example the planned and existing game farms on Farm Dankbaarheid No. 244 and Farm Newlands No. 42, north and west of the proposed solar facility), the proposed development is anticipated to have a greater overall positive impact on the local economy, than the No-Go Option (van Jaarsveld, 2022). The proposed solar facility can be considered to be supported by the NDP.

The Free State PSDF identifies the southern Free State, in particular the Xhariep region, as the ideal location for solar energy developments. The proposed development falls outside of this area. As a key economic driver in the Free State, agricultural resources need to be protected and only used for other

activities when this will result in meaningful and lasting benefits. Based on the findings of the economic assessment (van Jaarsveld, 2022) and agricultural assessment (Lanz, 2022), the proposed solar facility was found to be an acceptable compromise and that it would result in meaningful benefits. Alternative designs could also be considered that allow for agricultural activities to continue, i.e. higher panels that allow for grazing underneath them. Mitigating visual impacts should however take preference to reduce social impacts.

It must be noted that Riebeeckstad and surrounds fall within a Tourism Scenic Corridor. Two nearby tourism facilities were identified, namely the two game farms already, which could be negatively impacted. The proposed solar facility can be considered to align with the PDSF, if detrimental impacts to the environment, human-wellbeing and tourism resources can be sufficiently mitigated.

Reducing greenhouse gases, through developing solar facilities is one of the strategic objectives in the Lejweleputswa District Municipality IDP 2017-2022, with existing solar energy projects at Dealesville and Boshof identified for further expansion. Although other areas have been identified for solar developments, the proposed solar facility could assist in offsetting the retrenchments occurring as a result of the declining mining industry, and thus can be considered to align with the IDP as long as it does not significantly compromise other sectors.

Little is noted within the Matjhabeng IDP for The Financial Year 2017 – 2022 in regard to solar developments, although it is noted that the municipality is endeavoring to reduce their carbon footprint and move towards green economy. Development should be driven by optimal utilisation of natural and infrastructural resources, and integrated planning principles.

(Myburgh and Bastile, 2019), note that tourism is an underdeveloped industry in the MLM, and the region hosts a number of unique features that could be developed for tourism, such as mines, agriculture, ecology and the potential film industry. Based on the spatial development Map 3 in the IDP, there are no planned tourism nodes or corridors around the proposed development site.

The findings from the reviewed literature indicate that there are no direct conflicts with national, provincial and local planning documentation. The proposed development is in support of planning documentation through contributing to job creation, stabilising national electricity generation and strengthening the renewable energy sector. If developing the proposed solar facility will not cause significant negative impacts to other sectors, in particular, agriculture, mining and tourism, it is deemed to align with the objectives of the reviewed planning documents.

7.1.2 Summary of Impact Ratings

Table 4: Summary of the impact significance ratings for the various impacts identified.

Impact		Without Mitigation	With Mitigation
Construction Phase			
Increased noise	Significance rating	M	L
	Cumulative impact	M	L
Potential increase in crime and/or fear of an increase in crime	Significance rating	M	L
	Cumulative impact	M	M
Health implications	Significance rating	M	L
	Cumulative impact	L	L
Disruption of daily living	Significance rating	M	L
	Cumulative impact	M	L
Loss of sense of place/visual impact	Significance rating	M	L

	Cumulative impact	M	M
Increased demand on existing infrastructure	Significance rating	L	L
	Cumulative impact	M	L
Livestock theft	Significance rating	M	L
	Cumulative impact	M	L
Creation of employment opportunities	Significance rating	M (+)	M (+)
	Cumulative impact	L (+)	L (+)
Knock on effects for local business	Significance rating	M (+)	H (+)
	Cumulative impact	L (+)	L (+)
Operational Phase			
Loss of the area's sense of place/visual impact	Significance rating	M	L
	Cumulative impact	MH	M
Improvement of national electricity supply	Significance rating	M (+)	-
	Cumulative impact	M (+)	-
Decreased tourism potential for the surrounding area	Significance rating	M	L
	Cumulative impact	M	M
Creation of employment opportunities	Significance rating	M (+)	M (+)
	Cumulative impact	L (+)	L (+)
Knock on effects for local business	Significance rating	L (+)	L (+)
	Cumulative impact	L (+)	L (+)
Financial benefit for landowners	Significance rating	M (+)	
	Cumulative impact	L (+)	
Decreased level of satisfaction with the living environment	Significance rating	M	L
	Cumulative impact	MH	M
Alignment with national, provincial and local planning	Significance rating	M (+)	-
	Cumulative impact	M (+)	-

7.1.3 Construction Phase

The most significant social issues associated with the Construction Phase include:

Potential Positive Impacts

- **Positive economic impacts – job creation and knock-on effects.**

The Construction Phase will create new employment opportunities for unskilled, semi-skilled and skilled positions. These will have a direct benefit for people being employed. The Applicant, contractors and employees will spend money on local goods and services, which will have positive economic knock-on effects for the local businesses. As far as possible, the Applicant and contractors must fill employment positions with local personnel from the immediate area and make use of local goods and services, to enhance positive economic impacts.

Potential Negative Impacts

- **Possible increase in crime (including livestock theft) and/or fear of an anticipated increase in crime.**

The Construction Phase will result in a significant number of 'new' people frequenting the area, including employees and potential job seekers, with new access routes being created to the farms as well. The increased activity in the area may also attract criminals. Farmsteads are particularly vulnerable to crime given their often remote and rural locations thus a fear of increased crime can be expected whether crime actually increases or not.

It is therefore recommended to guard against creating unrealistic expectations and that the application process be conducted at the expected source of local employment, in order to avoid a potential influx of work seekers to the area immediately surrounding the solar facility. The Applicant will need to strictly manage personnel on site and private entrances. Sufficient security staff will need to be placed at the solar facility during all phases of the proposed development.

- **Impacts affecting the sense of place and disruption to daily living (including increased noise)**

Impacts affecting the sense of place, disruption to daily living and increased noise have been grouped together here, because of overlap with each other and the impacts stem from the same source. While these impacts have significant potential to be a nuisance and inconvenience to farmers and residents, they are temporary and will, in the case of noise and activity, largely cease with completion of construction. Implementation of mitigation measures will be important to ensure impacts remain within acceptable levels.

7.1.4 Operational Phase

The significant social issues associated with the Operational Phase include:

Potential Positive Impacts

- **Electricity generation from a renewable resource**

Development of the proposed solar facility will help address the electricity shortage South Africa is experiencing and will be doing so utilising a renewable resource, helping shift the country to more sustainable energy production methods. On an individual scale electricity generation is anticipated to have a Medium positive impact, with Medium positive cumulative impacts when one considers the other facilities being constructed as part of the Khauta cluster and future such developments.

- **Job creation and economic knock-on effects**

Once operational approximately 15 to 20 fulltime employment positions will be created. A limited number of these positions will be unskilled thus some of them will need to be filled by skilled individuals, potentially from outside the local area. The additional jobs created are anticipated to have a positive Medium impact on the surrounding community, or a very localised positive High impact for those employed. Likewise, very localised positive High impacts will occur for the landowners hiring their land to the Applicant. Positive economic knock-on effects will be experienced by local businesses from money spent by those employed and the Applicant on local goods and services, but to a much lesser degree than is anticipated during the Construction Phase.

Potential Negative Impacts

- **Loss of sense of place and decreased satisfaction with living environment**

The visual impact of the proposed solar facility is the chief impact from which a loss of 'sense of place' and a decreased satisfaction with the living environment will stem. The development site and surrounds have a fairly flat topography with a generally low vegetation structure which means the proposed solar facility will be fairly visible from the surrounds. Glare and observing industrial infrastructure will detract from the areas rural sense of place which the farmers and residents in the area are accustomed to. Activity from daily operations will disturb daily life, although this is expected to be limited during the Operational Phase. Impacts to sense of place are not anticipated to extend to

the suburb of Riebeeckstad. While Khauta South is one of the largest solar facilities in the Khauta cluster but given its distance from farmsteads and the two game farms, it is anticipated that it will have a Low impact on the surrounding area's sense of place. Impacts to sense of place are expected to be Medium when considering the cumulative impacts that will occur as a result of the other facilities to be developed as part of the Khauta cluster.

- **Decreased tourism potential**

The decreased potential for tourism primarily concerns the economic viability of game farming. Concerns were raised by game farmers, whose operations rely on the area's sense of place to create a "being in Africa" feel which is particularly important for attracting overseas clients. The game farms Dankbaarheid No. 244 and Newlands 42 are situated approximately 2.2km north and 3.2km west of the Khauta South facility respectively. Given this distance impacts to the tourism potential of the game farms is expected to be Low. Khauta South is situated nearby the Commandants Pan, approximately 250m away. Although Commandants Pan has not been identified as a significant tourist attraction, developing Khauta South so nearby the Pan is likely to lower future tourism potential.

As part of the Khauta cluster, negative cumulative impacts of a Medium nature to tourism potential are anticipated, although these impacts will be limited, i.e. restricted to the two game farms and potential tourist developments around the Pan (e.g. birding). The development of future nature-based tourist attractions immediately around the proposed development is unlikely.

7.1.5 Decommissioning Phase

As mentioned previously, similar impacts to those that will occur during construction, will occur during the Decommissioning Phase. A temporary increase in economic benefits, through the jobs created and the spend on local goods and services, can be expected. Once decommissioned, the sense of place will be returned to what it is currently, assuming that no other industrial type developments have taken place around the proposed development site. Negative impacts include job losses if a similar facility is not established elsewhere (approximately 15 to 20 full time positions), a potential temporary increase in crime and disturbance to daily life. Overall impacts are anticipated to be positive during and after decommissioning, assuming that an alternative facility has or will be developed elsewhere to continue to meet electricity needs.

7.1.6 Cumulative Impacts

As already mentioned, the proposed Khauta South solar facility forms part of the proposed Khauta cluster, including three other solar facilities. Developing Khauta South, along with the other three solar facilities, will significantly cumulate impacts to sense of place, which is anticipated to be the most significant negative cumulative impact during the construction and operational phases. This will particularly occur around the Commandants Pan, where Khauta North adjoins Khauta South, surrounding the Pan on its western and norther edges. Furthermore, Environmental Authorisation has been granted for seven other solar facilities within 30km of the Khauta cluster, with the closest of these being 11.4km away.

With the implementation of mitigation measures, other negative impacts are expected to be Low to Medium when factoring in the other solar facility developments. Many of the Free State's roads are in a poor state, which will be compounded, particularly gravel roads, with additional construction vehicles frequenting the roads in the area. If all four facilities are constructed, they should be constructed at the same time, to restrict construction phase impacts to the shortest time period.

While some of the cumulative impacts are rated as Medium, in spite of implementing mitigation measures, these impacts are expected to be localised and are not considered a fatal flaw to the proposed development.

Positive impacts are expected to be Medium-High during the Operational Phase when the cumulative benefit of electricity generation capacity will occur.

7.1.7 Assessment of No-Go option

Potential Negative Impacts

Negative impacts associated with the No-Go option include forfeiting the jobs that could be created and the spend on local goods and services. Considering the relatively high unemployment rate of the local municipality and declining mining industry in the area, this is not favourable. An opportunity to mitigate the electricity shortages being experienced in South Africa and to strengthen the renewable energy sector will not be realised. Given the current energy crisis, not developing the facility is likely to have a regional impact on electricity provision. Opportunities to develop the facility, or similar will have to be sought elsewhere.

Potential Positive Impacts

The No-Go option would result in the current land use continuing, i.e. agriculture. There would be no impact to the area's sense of place and there will be no increase in crime or fear of an increase in crime (solely as a result of the solar facility). The financial viability of the two nearby game farms in the area would be unaffected and the potential for future tourist activities or developments around Commandants Pan will not be affected. Positive impacts in terms of sense of place and satisfaction with the living environment would be relatively localised, as there are only approximately 8 neighbouring farmsteads. The no-go option of not developing on identified environmental sensitive areas (i.e. excluding them from development) will avoid the negative environmental impacts that could occur and mitigate potential impacts to tourism attractions such as the Commandants Pan.

7.2 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This SIA has found the surrounding community to generally be accepting of the proposed solar facility development, although there are at least two instances where surrounding landowners have raised objections relating to the cumulative impacts that the solar cluster, including Khauta South, will have on the area's sense of place.

A change in 'sense of place' is anticipated to be the most significant impact experienced by surrounding and nearby landowners and at the Commandants Pan. Impacts to the sense of place will occur during both the construction and operational phases, but are expected to be greater during the operational phase given the duration of the impact (i.e. for the entire life time of the solar facility). The Free State PSDF notes that the locating of renewable energy developments must avoid visual impacts on landscapes of significant symbolic, aesthetic, cultural or historic value and should blend in with the surrounding environment as far as possible. The landscape surrounding the proposed development does hold aesthetic value at a local scale, but not at a regional scale, thus sense of place impacts will be localised. Negative impacts of an economic nature due to a change in sense of place are expected to be limited to the known game farms. The significance of a change in sense of place

impact will thus vary between landowners based on whether it has economic implications (game farmers) or is only a nuisance. Where the impact is economic, animosity towards the solar facility may be created as well as fear/anxiety over future economic viability. Altering the sense of place will also reduce the likelihood of future tourism-related initiatives in the immediate area.

Disturbance to daily life, due to increased noise and activity in the area, will be temporal and chiefly associated with the Construction Phase. Through implementing mitigation measures, good planning and close working with the surrounding landowner, these impacts can be reduced to acceptable levels. A potential increase in crime, while also likely to be temporal, needs to be mitigated however possible, as it has the potential to have Very High negative consequences if impacts are realised. While an increase in crime is not entirely within the Applicant's control, they must work closely with farmers to reduce the potential for an increase.

It is expected that potential health impacts during construction can be sufficiently mitigated and are not expected to be a significant concern.

Economic benefits to the surrounding area will be significant and benefits are expected to outweigh the negative economic impacts (van Jaarsveld, 2022). Economic benefits will extend across the Construction and Operational Phases, with greater positive impacts expected during the Construction Phase. Positive economic impacts relate directly to positive social impacts. With a decline in the mining industry (Myburgh and Bastile, 2019), developing the solar facility will assist in offsetting job losses, albeit a small influence.

The proposed development can be considered to align with the reviewed planning documentation, as it is expected to have positive economic impacts which outweigh other impacts, without significantly compromising other sectors. It is noted that agricultural resources must be protected. While agriculture is a small contributor to the local municipality's economic output (1.1%) (Myburgh and Bastile, 2019) economic resources should still be protected. In this regard, a design that allows for agricultural activities to continue (e.g. grazing beneath panels) should be considered. A design with lower visual impacts should however take preference. It must also be noted that the Xhariep region and existing solar energy projects at Dealesville and Boshof have been identified as preferred areas for future solar developments.

Cumulative Impacts

Khauta South as a standalone solar facility will have Low to Low-Medium social impacts but when considering the three other solar facilities proposed, all impacts will be more likely Medium to High-Medium. Sense of place, which is associated with tourism potential and satisfaction of the living environment, is anticipated to be impacted the most significantly by the cumulative visual impact of the four solar facilities, as can be seen in **Table 4**. The clustering of the solar facility is however preferred, as it restricts social impacts to one area. It must be noted that these impacts will be fairly localised, i.e. only affecting the surrounding farms, and as such this is not regarded as a fatal flaw.

During the Construction Phase, daily living will be disrupted, and more so if there are larger construction crews in the area due to several solar facilities being constructed. Road infrastructure in the area will be impacted, and impacts will be compounded with the other three other construction projects in the area will numerous heavy construction vehicles frequenting the area. Through implementing mitigation measures, cumulative impacts can be reduced to a Low significance for the majority of the Construction Phase aspects.

Recommendations and Mitigation Measures

Mitigation measures to reduce negative impacts and improve positive impacts are provided in the Impact Rating tables in Section 6 and summarised in the Executive Summary. These mitigation measures must be included in the final Environmental Assessment Report. While these mitigation measures aim to address the range of social impacts identified, the list is not exhaustive and other mitigation measures may be applicable.

7.3 IMPACT STATEMENT

The findings of this SIA indicate that if mitigation measures are implemented, negative impacts can be lowered to acceptable levels. The findings from the SIA anticipate that the social benefits received out-weigh the negative impacts. Significant negative impacts, associated with a loss of sense of place, are anticipated but these impacts will be localised (i.e. limited to surrounding landowners), whereas positive economic impacts are expected to be further reaching, at least to a municipal level. Despite being localised, impacts on surrounding landowners, in particular the game farms, must be considered and mitigated wherever possible. Measures to lower the visual impacts during the Operational Phase will be key in lowering significant cumulative impacts to sense of place that will be experienced by surrounding landowners. The renewable energy generated must first be used to address the needs of the province before being exported, as stated in the PSDF.

It must be noted that if mitigation measures are not adhered to then construction of the proposed solar facility could have Medium negative impacts on the surrounding landowners and the area's current and future tourism industry.

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Appendixes

1. Impact Rating Methodology
2. Consultant's CVs
3. Organs of State and Interested and Affected Parties Notified and/or Consulted

Appendix - 1

METHODOLOGY USED FOR THE ASSESSMENT OF POTENTIAL IMPACTS

All impacts (direct and cumulative) of the above-mentioned issues, as well as other issues that may have been identified throughout the report will be assessed in terms of the following criteria:

Impact Assessment Methodology

For each potential impact, the EXTENT (Spatial scale), MAGNITUDE (degree of the impact), DURATION (time scale), PROBABILITY (occurrence), will be assessed by the EAP as well as the Specialists. The assessment of the above criteria will be used to determine the significance of each impact, with and without the implementation of the proposed mitigation measures. The scale to be used to assess these variables and to define the rating categories are tabulated in **Table 5** and **Table 6** below.

Table 5: Evaluation components, ranking scales and descriptions (criteria).

Evaluation component	Ranking scale and description (criteria)
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high: Bio-physical and/or social functions and/or processes might be <i>severely</i> altered.</p> <p>8 - High: Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered.</p> <p>6 - Medium: Bio-physical and/or social functions and/or processes might be <i>notably</i> altered.</p> <p>4 - Low : Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered.</p> <p>2 - Very Low: Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered.</p> <p>0 - Zero: Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high (positive): Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced.</p> <p>8 - High (positive): Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced.</p> <p>6 - Medium (positive): Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced.</p> <p>4 - Low (positive): Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced.</p> <p>2 - Very Low (positive): Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced.</p> <p>0 - Zero (positive): Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
DURATION	<p>5 - Permanent</p> <p>4 - Long term: Impact ceases after operational phase/life of the activity > 10 years.</p> <p>3 - Medium term: Impact might occur during the operational phase/life of the activity – 10 years.</p> <p>2 - Short term: Less than one year.</p> <p>1 - Immediate: Less than 1 month.</p>
EXTENT (or spatial scale/influence of impact)	<p>5 - International: Beyond National boundaries.</p> <p>4 - National: Beyond Provincial boundaries and within National boundaries.</p> <p>3 - Regional: Beyond 5 km of the proposed development and within Provincial boundaries.</p> <p>2 - Local: Within 5 km of the proposed development.</p> <p>1 - Site-specific: On site or within 100 m of the site boundary.</p>

FREQUENCY OF OCCURRENCE OF IMPACT	<p>5 – Continuous: Impact will occur continuously throughout the lifetime of the activity.</p> <p>4 – Very Frequent: Impact will occur a few times a week to daily.</p> <p>3 – Frequent: Impact will occur a few times a month.</p> <p>2 – Occasional: Impact will occur once or twice a year.</p> <p>1 – Very Rare: Impact will occur once or twice a decade.</p>
PROBABILITY (of occurrence)	<p>5 - Definite: >95% chance of the potential impact occurring.</p> <p>4 - High probability: 75% - 95% chance of the potential impact occurring.</p> <p>3 - Medium probability: 25% - 75% chance of the potential impact occurring</p> <p>2 - Low probability: 5% - 25% chance of the potential impact occurring.</p> <p>1 - Improbable: <5% chance of the potential impact occurring.</p>
Evaluation component	Ranking scale and description (criteria)
CUMULATIVE IMPACTS	<p>High: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Medium: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Low: The activity is localised and might have a negligible cumulative impact.</p> <p>None: No cumulative impact on the environment.</p>

Table 6: Definition of significance ratings (positive and negative).

Significance Points	Environmental Significance	Description
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

Once the evaluation components have been ranked for each potential impact, the significance of each potential impact will be assessed and assigned a significance rating, as per Table 5 above.

Appendix – 2



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 Unit 81, Millenium Business Park, Block B
 Situated at 19 Edison Way, Century City
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Gerbrecht Elizabeth (Elbi) Bredenkamp

Name & Surname	Gerbrecht Elizabeth (Elbi) Bredenkamp
I.D Number	6402130036082
Nationality	South African
Home Language	Afrikaans
Proficiency in Other Languages	<p>English</p> <ul style="list-style-type: none"> - Spoken = Excellent - Written = Excellent - Reading = Excellent <p>South Sotho</p> <ul style="list-style-type: none"> - Spoken = Fair
Parent Firm	King's Landing Trading 507 (PTY) LTD t/a Enviroworks
Position	Director
Years' Experience	23 years
Educational Qualifications	<p>2022- Negotiation Strategies and Dispute Resolution- Mediation Succeed- Adv AC Oosthuizen SC</p> <p>2021- Decision Makers in Public Participation- January 2021 – International Association of Public Participation (IAP2) Fundamentals of Engagement- July 2021- International Association of Public Participation (IAP2)</p> <p>2012- Greenhouse Gas Verification Training of the JCM (Joint Credit Mechanism LRQA Japan Proposed by the Japanese Government) ISO 14054, ISO 14064, JCM (BOCM) Manuals, LRQA GHG Verification Procedures.</p> <p>2012 – Systems & Greenhouse Gases ((GHG) Technical Assessor Course, SANAS South African National Accreditation System- ISO 14065- distinction</p> <p>2010 – International Training: Cork and London: ISO 14064-1/2/3/4 - Carbon Action (UK)</p> <ul style="list-style-type: none"> • Measuring your Organisation's Carbon Footprint: ISO 14064-1: Essentials – GHG Inventories (50018728/50052908) • Reducing your Organizational Environmental Impact: ISO 14064-2: Essentials – GHG Projects (50018741-50052911) • Carbon Emission Reduction Expert Course: ISO 14064-2 Expert – GHG Projects (50018731/50052909) • Greenhouse Gas Verification: Using ISO 14064 (50029594-50052913) Courses successfully completed in England & Ireland on Carbon Footprint measuring and verification

	<p>2000- 2002-</p> <ul style="list-style-type: none"> • Principles of EIA Review Course US EPA, in Pretoria, RSA • Conflict Management Durban, RSA • Environmental Law (with distinction) Aldo Leipoldt Institute, Pretoria, RSA <p>1997-1999 –</p> <ul style="list-style-type: none"> • Mineral Laws Administration and Environmental Management University of Pretoria, RSA • Principles of the Rehabilitation of Disturbed Areas University of the North-West, RSA • Environmental Impact Assessment University of the North-West • Environmental Management Systems (SABS/ISO 14001) University of the North-West, RSA • Environmental Policy and Management in Mining and Minerals University of Johannesburg, RSA • The Measurement of Biodiversity University of the Free State, RSA • Environmental Management Systems (SABS/ISO 14001) University of the North-West, RSA - 1997 – 1999 <p>1994 - M.Sc Botany (Cum Laude) - University of the Free State</p> <p>1987 - B.Sc Honours Botany - University of the Free State</p> <p>1986 - B.Sc - University of the Free State</p>
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Professional Qualifications

Professional Associations

- Registered Scientist with the South African Council for Natural Scientific Professions (SACNASP) (Pr.Sci.Nat. 400328/11)
- International Association of Impact Assessment South Africa (IAIASa) (Member No 3893)
- International certified Carbon Verifier (auditor)
- SANAS accredited System & Green House Gas Technical Assessor
- Member and Certified Carbon Verifier with the Carbon Protocol of South Africa
- Accredited Consultancy Partner with the Carbon Disclosure Project- 2012
- International Association for Impact Assessment South Africa (IAIASa) – Branch Chair from 2011 -2013
- IAP2 Southern Africa (IAP2 SA) affiliate to the International Association for Public Participation (IAP2)
- Accredited Chartered Public Relations Practitioner (Member no:73740) with the Public Relations Institute of South Africa (CPRP PRISA)

Special Awards

- Prof. E M van Zinderen Bakker - Prize (Best M.Sc. - Dissertation) & Honours in academics
- Dean's Medal (Best Magister Student)
- S2A3 - GENCOR - Bronze Medal (Best M.Sc. Thesis in Dept. Botany and Genetics)
- Africa Growth Awards Overall Winner Services Sector- 2012
- SEDA Business Competition Overall Provincial Winner- 2012

Publications

Die Suid-Afrikaanse Tydskrif vir Natuurwetenskap en Tegnologie: Jaargang 15, Maart 1996: *“Evidence that thermoinhibition and the alleviation thereof by oxygen plus kinetin in Great Lakes lettuce seed is related to mitochondrial function.”* ISSN 0254-3486



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Michael Leach

RELEVANT QUALIFICATIONS

- Bachelor of Science in Conservation Ecology: University of Stellenbosch (2015)

Other Courses

- IAP2 Public Participation Training (31/10/2018)
- Snake Awareness: First Aid for Snakebite and Venomous Snake Handling (12/12/2020)

REGISTRATIONS & MEMBERSHIP:

EAPASA Registered EAP: 2021/3872

IAIAsa: 6051

IAP2: IAP2SA022

WORK EXPERIENCE – 5 Years

2016: Operations and maintenance (*Cape Kaskar*)
February 2017 – November 2017: Environmental Control Officer (*Peninsula Permits*)
June 2017 – August 2017: Field Assistant fynbos and *Protea* research (*Post Graduate Students, SU*)
November 2017 – February 2018: Field Assistant - Vegetation Mapping (Postdoctoral Student, SU)
May 2018 – Present: Environmental Consultant (*Enviroworks*)

BASIC ASSESSMENT EXPERIENCE

Environmental Assessment Practitioner (EAP)

- Proposed Development of a Telecommunication Base Station and Associated Infrastructure on Portion 8 of The Farm Delta No. 1003, Groot Drakenstein, Western Cape Province (*Coast to Coast*) - 2018
- Proposed Development of New Sports Fields For Curro Holdings, on Portion 110 of The Farm Olifantsvlei No. 327, Johannesburg South, Gauteng Province (*Curro Holdings*) - 2018
- The Proposed Development of a Thirty Five Metre (35M) Telecommunication Base Station and Associated Infrastructure on Remaining Extent of Portion 13 of The Farm Van Aries Kraal No. 455, Grabouw, Western Cape Province (*Coast to Coast*) - 2019
- The Proposed Construction of a Curro School on Portion 54 of The Farm Blue Hills No. 397, Midrand, Gauteng Province (*Curro Holdings*) - 2019

- The Proposed Expansion of The Diesel Storage Capacity For Backup Power, on Erf 358, Midrand, Gauteng Province (*Liquid Telecom (Pty) Ltd*) - 2019
- The Proposed Development of a Backup Energy Centre Including Diesel Storage and Generators, on Erf 142504, Diep River, Cape Town, Western Cape Province (*Liquid Telecom (Pty) Ltd*) – 2020
- The Proposed Development of a Thirty Meter (30m) Telecommunication Base Station and Associated Infrastructure on Portion 87 of The Farm Langverwacht No. 241, Kuils River, Western Cape Province (*Atlas Tower (Pty) Ltd*) – 2020
- Proposed Upgrades to the Alpha 1 Recreational Lounge, Robben Island, Western Cape (*Robben Island Museum*) – Current
- The Development of Fifteen (15) Resort Units on Portion 12 of the Farm Riet Valley No. 452, Gouritzmond, Western Cape Province (*Hessequa Local Municipality*) – Current
- The Proposed New Reception Area, Upgrading of the Main Entrance Gate, New Day Visitors Area and Family Chalets at Addo Elephant National Park, Eastern Cape Province (*SANParks*) – Current
- The Proposed Development of a Twenty Five Metre (25m) Telecommunications Mast on Portion 3 of the Farm No. 452, Elgin Valley, Western Cape (*Atlas Tower*) – Current
- The Proposed Development of a Battery Energy Storage System (BESS) at the Ashton Substation, Ashton, Western Cape Province (*Eskom Holdings SOC Ltd*) – Current

Review EAP

- The Proposed Development of a Thirty Five Metre (35m) Telecommunication Base Station and Associated Infrastructure on Portion 42 of Farm 428, Plettenberg Bay, Western Cape Province (*Atlas Tower (Pty) Ltd*) – 2021
- The Proposed Development of a Twenty Five Metre (25m) Telecommunication Base Station and Associated Infrastructure on Lorraine Farm, The Remainder of Farm 790, Phillipi, Western Cape Province (*Atlas Tower (Pty) Ltd*) – 2021
- The Proposed Development of a Thirty Metre (30m) Telecommunications Mast on Portion 24 of Olyven Boomen Farm Number 83, Malan Valley, Wellington Western Cape (*Atlas Tower*) – Current

SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT EXPERIENCE

- Proposed Housing Development on the Farm Carolina No. 217, Great Kei Local Municipality, Eastern Cape Province (*Department of Agriculture, Land Reform and Rural Development*) – Current

SPECIALIST EXPERIENCE

- Socio-Economic Impact Assessment as Part of The Application for The Amendment of The Existing Mine Right Held By Tja Naledi for The Mining of Sand, To Include Aggregate on Portion 4 of The Farm Woodlands 407, Ngwathe Local Municipality, Free State Province (*Greenmined (Pty) Ltd*) - 2019
- Social Impact Assessment for the Proposed Development of the Gromis-Nama-Aggeneis 400 Kv IPP Integration, Springbok, Northern Cape Province (*Eskom Holdings SOC Ltd*) - 2019/2020

- Public Participation Facilitator – City of Cape Town City Wide Public Transport Infrastructure Programme (*BVi Consulting Engineers*) – Current

ENVIRONMENTAL CONTROL OFFICER (ECO) EXPERIENCE

- Photographic and film shoots at various environmentally sensitive locations around Cape Town (*Peninsula Permits*) - 2017
- Periodic Maintenance of National Route 2 Section 4 between Swellendam and Rivieronderend, Western Cape Province (*SANRAL*) - 2018
- External Environmental Compliance Audit - The Periodic Maintenance of TR31 /1 (Km13.58-km45.02), TR 31/2 (Km2.16-Km 15.68) and MR0287 (Km 2.69-Km 14. 50) - Worcester to Robertson to Ashton (*BVi Consulting Engineers*) - 2019
- Development of an Electricity Switching Station on a Portion of Stellenbosch Farm St794/37, Somerset West (*BVi Consulting Engineers*) – 2020
- Cabling From Paardevlei Switching Station to Helderberg Main Substation, Somerset West, Western Cape Province (*BVi Consulting Engineers*) – 2021
- Construction Works at the Dunoon Public Transport Interchange, Dunoon, Western Cape Province (*BVi Consulting Engineers*) – 2021
- Proposed Development of a Twenty-Five Metre (25m) Telecommunication Base Station and Associated Infrastructure on Lorraine Farm, the Remainder of Farm 790, Phillipi, Western Cape Province (*SBA Tower (Pty) Ltd*) – 2021
- The Proposed Restoration and Maintenance of the Blue Stone Quarry Wall, Robben Island (*Robben Island Museum*) – Current
- The Proposed Road Upgrades to the Stikland Psychiatric Hospital, Bellville, Western Cape Province (*BVi Consulting Engineers*) - 2022
- River Maintenance for Bath River, Caledon, Western Cape Province (*Theewaterskloof Municipality*) - 2022

ENVIRONMENTAL OFFICER EXPERIENCE

- Environmental Officer for *Vestas Southern Africa (Pty) Ltd.* - Oyster Bay Wind Farm, Oyster Bay, Eastern Cape Province - July 2020 – April 2021
- Environmental Officer for *Vestas Southern Africa (Pty) Ltd.* – Karusa Wind Farm and Soetwater Wind Farm, Sutherland, Northern Cape Province – 2021

SCREENING ASSESSMENT EXPERIENCE

- Screening for the Proposed Discarding of Milling Material at Three Stockpile Locations as Part of the Actophambili Road Works Along the R43 Between Worcester and Woseley, Western Cape. (*Actophambili Roads*) - 2019

- Improvement of the National Route R101 Section 08 From Bela Bela (0.0km) to Modimolle (26.8km), Limpopo Province (*BVi Consulting Engineers Western Cape*) - 2020
- The Improvement of National Road R516 Section 1 From R511 (Km 0.0) to Toospruit (Km 36.67), Limpopo Province (*BVi Consulting Engineers Western Cape*) - 2020
- The Improvement of National Road R516 Section 1 From Toospruit (Km 36.67) to Bela Bela (Km 83.8), Limpopo Province (*BVi Consulting Engineers*) - 2020
- Improvement of the National Road R72 From Section 1, Km 48.70, to Section 2, Km 1.20, Alexandria, Eastern Cape Province (*BVi Consulting Engineers*) – 2021
- Social Screening Assessment for the Proposed Development of the Khauta Solar Photovoltaic (PV) Cluster Near Welkom, Free State Province (*WKN Windcurrent*) – November 2021
- Upgrade of National Route N1 Section 28 from Dwarsriver (Km 49.0) to Louis Trichardt (Km 98.75), Limpopo Province (*BVi Consulting Engineers*) – 2022

WATER USE LICENSES

- Water Use License for the Proposed Development of a Pipeline from the Zandvliet Waste Water Treatment Works to the Macassar Waste Water Treatment Works, Western Cape Province (City of Cape Town) – Current
- Water Use License for the Development of Fifteen (15) Resort Units on Portion 12 of the Farm Riet Valley No. 452, Gouritzmond, Western Cape Province (*Hessequa Local Municipality*) – Current

OTHER EXPERIENCE

- Youth Work – Teenage youth leader (*Pinelands Baptist Church*) - 2012 – 2020
- CDM Degassing Plant – Calibration and data capture (*Promethium Carbon (Pty) Ltd*) - 2018 – 2021
- Bird Monitor for the proposed Umsinde Emoyeni Wind Energy Facility, Murraysburg, Western Cape (*Arcus Consulting*) - April 2017
- Bird Monitor for the proposed Kap Vley Wind Energy Facility, Klienzee, Northern Cape (*Arcus Consulting*) - May 2017
- Field Assistant, Bat mast decommissioning, for the proposed Kap Vley Wind Energy Facility, Klienzee, Northern Cape (*Arcus Consulting*) - March 2018
- Residential Alien Invasive Species Report (*Private*) - 2019
- Plant Species Identification Report for The Widening of a the R60 Road Between Worcester and Ashton, Western Cape Province (*BVi Consulting Engineers*) - 2018

Appendix - 3

Organs of State and Interested and Affected Parties Notified and/or Consulted

Organs of State
Department of Water and Sanitation: Local Catchment Management Agency
Department of Mineral Resources and Energy (DMRE)
Free State Province Department of Economic, Small Business Development, Tourism and Environmental Affairs
South African Civil Aviation Authority (CAA)
National Department of Forestry, Fisheries and the Environment (DFFE): Biodiversity and Conservation
Free State Province Department of Agriculture and Rural Development
South African National Roads Agency (SANRAL)
Free State Department of Agriculture
National Department of Agriculture, Land Reform and Rural Development (DALRRD)
Free State Heritage Resources Authority (FSHRA)
Free State Province Department of Public Works and Infrastructure
Matjhabeng Local Municipality
Lejweleputswa District Municipality
Eskom: Distribution (Free State)
South African National Roads Agency (SANRAL)
National Department of Forestry, Fisheries and the Environment
South African Radio Astronomy Observatory (SARAO)
South African National Heritage Resources Agency (SAHRA)
South African National Defence Force

Landowners
Dankbaarheid No. 244
Hartplaats No. 194
Newlands No. 42
Portion 0 of Kopje Alleen No. 81
Portion 1 of Commadants Pan No. 424
Portion 1 of De Hoop No. 276
Portion 1 of Elsinore No. 12
Portion 1 of Erfdeel Farm No. 188
Portion 1 of Klein Koppie Aleen No. 182
Portion 1 of Klein Koppie Aleen No. 182
Portion 1 of Kopje Alleen No. 81
Portion 1 of Mimosa No. 334
Portion 1 of Nooitgedacht No.74
Portion 12 of Nooitgedacht No.74
Portion 13 of Nooitgedacht No.74
Portion 14 of Wonderkop No. 15
Portion 2 of Dankbaarheid No. 187

Portion 2 of Klein Koppie Aleen No. 182
Portion 2 of Kopje Alleen No. 81
Portion 3 of Klein Kopje Aleen No. 182
Portion 3 of Kopje Aleen No. 81
Portion 5 of Kopje Alleen No. 81
Portion 5 of Nooitgedacht No.74
Portion 6 of Commandants Pan No. 382
Portion 9 of Commandants Pan No. 382
Portion 1 of Commandants Pan No. 382
Remaining Extent of Commandants Pan No. 424
Remaining Extent of Helderwater No. 494
Remaining Extent of Klein Koppie Aleen No. 182
Remaining Extent of Wonderkop No. 15
Tafel Baai No. 413
Uitkijk No. 509

Other Interested and Affected Parties

Farmers Watch Group
G7 Renewable Energies (Pty) Ltd
Henneman Veiligheids Association
Henneman Farmers Association
WKN Windcurrent