



SOCIAL IMPACT REPORT

HARMONY JOEL SOLAR PV
IMPACT ASSESSMENT REPORT
JANUARY 2023

SOCIAL IMPACT REPORT

Harmony Joel Solar PV Facility, Free State

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Free State

ACRONYMS, ABBREVIATIONS AND GLOSSARY

Acronyms & Abbreviations	
DESTEA	Free State Department of Economic, Small Enterprise, Tourism and Environmental Affairs
DOE	Department of Energy
DM	District Municipality
EA	Environmental Authorization
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme
GDP	Gross Domestic Product
GNR	Government Notice
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
IRP	Integrated Resource Plan
KM	Kilometers
LM	Local Municipality
NEMA	National Environmental Management Act (No. 107 of 1998)
NDP	National Development Plan
O&M	Operation and Maintenance
PGDS	Provincial Growth and Development Strategy
PICC	Presidential Infrastructure Coordinating Committee
PSDF	Provincial Spatial Development Framework
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SIP	Strategic Infrastructure Project

EXECUTIVE SUMMARY

DESCRIPTION OF PROPOSED PHOTOVOLTAIC FACILITY

Freegold Harmony (Pty) Ltd (a subsidiary of Harmony Gold Mining Company Ltd) is looking to supplement its energy supply by implementing Photovoltaic (PV) generation, aiding their transition to a more sustainable and environmentally friendly energy mix.

The development of a solar photovoltaic (PV) facility with a generating capacity of up to 18MW is proposed 900m north east of the Harmony Joel operations, approximately ~20km north east of the town of Theunissen within the Masilonyana Local Municipality and within the Lejweleputswa District Municipality, Free State Province. The PV facility is located on Portion 0 of the Farm Leeuwbult 580. The solar PV development will be known as Harmony Joel Solar PV Facility.

The preferred site for the project is on a property which is privately owned by the Mine and are available for the proposed project and is therefore deemed technically feasible by the project developer for such development to take place.

A project site considered to be technically suitable for the development of the solar PV facility, with an extent of approximately 1000ha, was identified. A development area of ~220ha was demarcated within this project site and allows an adequate footprint (~47ha) for the installation of a solar PV facility with a contracted capacity of up to 18MW, while allowing for the avoidance of environmental site sensitivities.

The infrastructure associated with the 18MW solar PV facility will include:

- PV modules and mounting structures
- Inverters and transformers a SCADA room, and maintenance room
- Cabling between the project components, to be laid underground where practical
- Access roads, internal roads and fencing around the development area.
- Temporary and permanent laydown areas and O&M buildings.
- Grid connection solution including an on-site facility substation, switching station, to be connected to the Shafts 1 & 2 HJ Joel Mining Substation via an overhead power line (located ~830m south west of the development footprint).

As of 2019, the Industrial sector was the leading electricity consumer in South Africa, with up to 56 percent of the total consumption (Ratshomo 2019). Mining and quarrying accounted for 10% of the industrial consumption while non-ferrous metals and non-metallic both accounted for 8% and 5%, respectively (Chamber of Mines of South Africa, 2017).

The successful development of the renewable energy projects will enable Harmony Gold to make a valuable and meaningful contribution towards growing the green economy within the province and South Africa. This will assist the Free State in creating green jobs and reducing Green House Gas emissions, whilst reducing the energy demand on the National Grid.

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

- The potential negative social impacts associated with the construction phase are typical of construction related projects and not just focused on the construction of PV facilities (these relate to influx of non-local

workforce and jobseekers, intrusion and disturbance impacts, safety and security) and could be reduced with the implementation of the mitigation measures proposed.

- Employment opportunities will be created in the construction and operational phase and the impact is rated as positive even if only a small number of individuals benefit in this regard.
- The proposed project could assist the local economy in creating entrepreneurial development, especially if local businesses could be involved in the provision of general material and services during the construction and operational phases.
- Capacity building and skills training among employees are critical and would be highly beneficial to those involved, especially if they receive portable skills to enable them to also find work elsewhere and in other sectors.
- The proposed development also represents an investment in infrastructure for the generation of clean, renewable energy, which, given the challenges created by climate change, represents a positive social benefit for society.

Recommendations

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

- In terms of employment related impacts, it is important to consider that job opportunities for the unskilled and semi-skilled are scarce commodities in the study area and could create competition among the local unemployed. Introducing an outside workforce will therefore most likely worsen local endeavours to obtain jobs and provoke discontent as well as put pressure on the local services available. Local labour should be utilised to enhance the positive impact of employment creation in the area. Local businesses should be involved with the construction activities where possible. It is imperative that local labour be sourced to ensure that benefits accrue to the local communities. Preference should thus be given to the use of local labour during the construction and operational phases of the project as far as possible.
- Locals should also be allowed an opportunity to be included in a list of possible local suppliers and service providers, enhancing the multiplier effect. This aspect would serve to mitigate other subsequent negative impacts such as those associated with the inflow of outsiders to the area, the increased pressure on the infrastructure and services in the area, as well as the safety and security concerns.
- Impacts associated with the construction period should be carefully mitigated to minimise any dust and noise pollution.
- Safety and security concerns should be considered during the planning and construction phases of the proposed project.

Conclusion

A site visit was undertaken during the Assessment Phase of the SIA. The site visit includes primary interviews with key stakeholders and interested and affected parties, interviews are semi-structured. Essentially the approach is to provide information on the proposed development to the stakeholders (including maps and diagrams showing location and what is planned etc.) and discuss the key activities that will take place, during the construction and operational phases.

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

FIT WITH POLICY AND PLANNING

The legislative and policy context applicable to a project plays an important role in identifying and assessing the potential social impacts associated with the development. In this regard a key component of the SIA process is to assess a proposed development in terms of its suitability with regards to key planning and policy documents.

The following key pieces of documentation were reviewed as part of this legislation and policy review process:

National Policy and Planning Context:

- Constitution of the Republic of South Africa, 1996
- National Environmental Management Act (No. 107 of 1998) (NEMA)
- White Paper on the Energy Policy of the Republic of South Africa (1998)
- National Energy Act (No. 34 of 2008)
- Integrated Energy Plan (IEP) (2015)
- National Development Plan (NDP) 2030 (2012)
- Strategic Infrastructures (SIPs)

Provincial Policy and Planning Context:

- Free State Provincial Growth and Development Strategy (FSGDS) (2005 – 2014)
- Free State Provincial Growth and Development Strategy (FSGDS), Revised October 2007
- Free State Provincial Spatial Development Framework (PSDF) - Executive Summary (Inception Report)
- Free State Green Economy Strategy (2014)
- Free State Investment Prospectus (2019)

Local Policy and Planning Context:

- Lejweleputswa District Municipality Integrated Development Plan (IDP) 2020 / 2021
- Masilonyana Local Municipality Integrated Development Plan IDP (2020 – 2021)

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1. INTRODUCTION

Eco-Thunder Consulting was commissioned by Savannah Environmental (Pty) Ltd as the lead consultant to manage the Social Impact Assessment (SIA) process for the establishment of the proposed Harmony Joel Solar PV Facility near Theunissen in the Free State Province.

This report contains the findings of the SIA undertaken as part of the broader Environmental Impact Assessment (EIA) process.

1.1. Terms of Reference

This SIA Report has been prepared as part of the Scoping and EIA process being undertaken for Harmony Joel Solar PV Facility and associated infrastructure. The purpose of this SIA Report is to provide details on the nature and extent of development of Harmony Joel Solar PV Facility, and the potential social impacts associated with the construction, operation, and decommissioning of the project. The inputs contained within this SIA Report are intended to provide a high-level overview of the social environment within which the project is proposed and identify potential social issues which will be addressed in detail as part of the EIA process specialist investigations.

The objective of this SIA Report is therefore to:

- Identified and review policies and legislation which may have relevance to the activity from a social perspective.
- Provide comment on the need and desirability of the proposed activity from a social perspective.
- Identify potential impacts and risks associated with the preferred activity and technology alternatives.
- Identify key social issues to be addressed in the BA phase.
- Agree on the level of assessment to be undertaken, including the methodology to be applied to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site.
- Identify suitable measures to avoid, manage or mitigate identified social impacts and determine the extent of residual risks that need to be managed and monitored.

1.2. Specialist Details

Eco-Thunder Consulting (ETC) is a 100% woman-owned, private company that specializes in a range of specialist studies, such as socio-economic research, economic development planning, development program design and implementation as well as community trust management. Based in Johannesburg, South Africa, Eco-Thunder has established itself as an expert on the conditions, needs and assets of communities that are linked to independent power generation facilities.

ETC has conducted research on behalf of and advised IPPs since 2017. Its client base is thus comprised of IPPs that have been successful across all the REIPPPP bidding rounds. ETC also implements development programs in energy communities, which ensures a comprehensive understanding of the how to drive positive social impact.

1.3. Report Structure

The report is organized into six sections:

- Section 1: Introduction.
- Section 2: Methodology & Approach.
- Section 3: Policy and Planning Review.
- Section 4: Overview of the Study Area.
- Section 5: Assessment of Key Social Issues and Impact.
- Section 6: Conclusions and Impact Statement.

1.4. Project Description

Freegold Harmony (Pty) Ltd (a subsidiary of Harmony Gold Mining Company Ltd) is looking to supplement its energy

supply by implementing Photovoltaic (PV) generation, aiding their transition to a more sustainable and environmentally friendly energy mix.

The development of a solar photovoltaic (PV) facility with a generating capacity of up to 18MW is proposed 900m north east of the Harmony Joel operations, approximately ~20km north east of the town of Theunissen within the Masilonyana Local Municipality and within the Lejweleputswa District Municipality, Free State Province. The PV facility is located on Portion 0 of the Farm Leeuwbult 580. The solar PV development will be known as Harmony Joel Solar PV Facility.

The preferred site for the project is on a property which is privately owned by the Mine and are available for the proposed project and is therefore deemed technically feasible by the project developer for such development to take place.

A project site¹ considered to be technically suitable for the development of the solar PV facility, with an extent of approximately 1000ha, was identified. A development area² of ~220ha was demarcated within this project site and allows an adequate footprint (~47ha)³ for the installation of a solar PV facility with a contracted capacity of up to 18MW, while allowing for the avoidance of environmental site sensitivities.

The infrastructure associated with the 18MW solar PV facility will include:

- PV modules and mounting structures
- Inverters and transformers a SCADA room, and maintenance room
- Cabling between the project components, to be laid underground where practical
- Access roads, internal roads and fencing around the development area.
- Temporary and permanent laydown areas and O&M buildings.
- Grid connection solution including an on-site facility substation, switching station, to be connected to the Shafts 1 & 2 HJ Joel Mining Substation via an overhead power line (located ~830m south-west of the development footprint).

As of 2019, the Industrial sector was the leading electricity consumer in South Africa, with up to 56 percent of the total consumption (Ratshomo 2019). *Mining* and quarrying accounted for 10% of the industrial *consumption* while non-ferrous metals and non-metallic both accounted for 8% and 5%, respectively (Chamber of Mines of South Africa, 2017).

The successful development of the renewable energy projects will enable Harmony Gold to make a valuable and meaningful contribution towards growing the green economy within the province and South Africa. This will assist the Free State in creating green jobs and reducing Green House Gas emissions, whilst reducing the energy demand on the National Grid.

1.5. Project Location

The Joel Solar PV Facility will be located on portion 0 of the Farm Leeuwbult 580 which is located 900m north-east of the Harmony Joel operations, approximately ~20km north east of the town of Theunissen within the Masilonyana Local Municipality and within the Lejweleputswa District Municipality, Free State Province. A development site of approximately up to 220ha for Joel Solar PV has been identified for the development of the Solar facilities, of which an approximate of 47ha will be identified for the project footprint.

The topography is characterised by slightly undulating plains with wetlands and / or drainage channels bisecting the area. The topography of the corridor can be described as generally favourable, when considering that most of the

¹ The project site comprises the affected properties for that identified area within which the development area and development footprint are located. It is the broader geographic area assessed as part of the EIA process, within which direct effects of the proposed project may occur. The project site is ~920ha in extent.

² The development area is that identified area where the 18MW PV facility is planned to be located. This area has been selected as a practicable option for the facility, considering technical preference and constraints. The development area is ~220ha in extent.

³ The development footprint is the defined area (47ha) located within the development area) where the PV panel array and other associated infrastructure for the Harmony Joel Solar PV facility is planned to be constructed. This includes the actual footprint of the facility, and the area which would be disturbed.

area consists of slopes of less than 1:5. The site is located at an altitude of between 900 and 940 meters above mean sea level (AMSL). Most properties situated within a 5km radius of the mine is being used for livestock and crop cultivation. The corridor is used for livestock farming and maize cultivation at present.

No formally protected areas occur in close proximity to the development. The closest protected area within the vicinity of development is the Willie Pretorius Game Reserve located to the east. Based on the distance between the proposed project and the protected area, no impact is expected to occur.

The area within which the development corridor is situated falls within the summer and autumn rainfall region with very dry winters and frequent frost that occurs during the colder winter months. The spatial and temporal distribution of rainfall is very complex and has great effects on the productivity, distribution and life forms of the major terrestrial biomes. The mean annual precipitation for the region is around 560mm. The mean annual temperature for the area is 15.2°C, and the mean annual frost days is 43 days. Mean Annual Potential Evaporation is 2226mm, with Mean Annual Soil Moisture Stress of 78%.

Receptors within the landscape which due to use could be sensitive to landscape change. They include:

Area receptors which include the towns of:

- Theunissen.
- Virginia.
- Welkom

Linear receptors, which include:

- R30.
- Bree Street.
- R708.
- S478.
- S494.
- S1622.
- R730.
- R73.
- Small Gravel Roads.
- Storm water channel.
- Railway line.
- Doring River.
- Sand River.
- Vet River
- Eskom Power Line Infrastructure.

The Masilonyana Local Municipality is a Category B municipality located within the Lejweleputswa District in the Free State. The municipality has been under administration from March 2017. It is situated between the province's biggest municipality, Mangaung Metro, in the south and the second-biggest municipality, Matjhabeng, in the north. It is one of five municipalities in the district. The following former Transitional Local Councils were amalgamated into the municipality: Theunissen, Brandfort, Winburg, Soutpan and Verkeerdevlei. It is an impoverished semi-urban area with a high unemployment rate. Theunissen is situated on the ZR Mahabane Corridor between Bloemfontein and Welkom and hosts the three mines within the municipal jurisdiction. The main economic sectors of the municipal area includes agriculture, mining and community services.

TABLE 1: SIA Features

Attribute Identified	Description	Impact associated	Score
Rivers and streams	Rivers (Such as the Doring River), Small pans and wetlands have been identified by the ecologist in the scoping report these are located to the north, east and west the final layout of the development.	Development which impacts on hydrological features are not advised, the area is predominantly driven by mining activities and water contamination may be a prevalent issue in the area, therefore resources such as these must be conserved. It is therefore important that the PV development contributes to the positive social gains which could be realized by the natural features in the area.	Negative if developed
Eskom Overhead lines	<p>A host of power lines criss-cross the study area, these include, but are not limited to:</p> <ul style="list-style-type: none"> • Lines which run Directly to the east of the development <ul style="list-style-type: none"> ○ VIRGINIA TERMINAL - WINBURG MUNIC 1 88kV Overhead Line (Duiker CNC) ○ JOEL - JOEL SHAFT 1 132kV Overhead Line ○ BEATRIX SHAFT-BEATRIX THREE 1 132kV Overhead Line ○ THERON TRACTION - WELGELEE TRACTION 1 132kV Overhead Line ○ THEUNISSEN MUNIC TEE 1 88kV Overhead Line ○ ORYX 2 - THESEUS 1 132kV Overhead Line ○ ORYX 1 - THESEUS 1 132kV Overhead Line ○ BEATRIX - THESEUS 1 132kV Overhead Line ○ THESEUS - VIRGINIA TERMINAL 2 132kV Overhead line ○ THESEUS 1 - VIRGINIA TERMINAL 1 132kV Overhead Line ○ KROONSTAD MUNIC - THESEUS 1 132kV Overhead Line 	<p>Powerlines do not pose a social risk, and the development area has been exposed to similar activities previously, this must however be taken into consideration in terms of avifauna.</p> <p>The planned grid connection will blend in with the current “Brand cluster” powerlines which run directly parallel to the road therefore would not contribute to any additional visual impact. The current safety measures utilized by Eskom, which will also be applicable for these powerlines to ensure the safety of the general public, therefore no additional social risk is anticipated, additionally although limited, the construction and maintenance of these lines will also create employment opportunity.</p>	Positive social
Substations	The proposed PV development will connect into the Shafts 1 & 2 HJ Joel Mining Substation.	No construction is planned to take place to build additional substations (although a switching station is planned as part of the PV layout) therefore the majority of the social impact should focus on providing the operators who will be working at these facilities, the technician servicing these areas etc, the proper tools and training to safely operate within these spaces without placing their health and safety at risk.	Negative Health and safety

Main access roads	<ul style="list-style-type: none"> ○ Access to the proposed development area is afforded by a secondary (local) road. Some additional roads in the area that may be utilized by the development include: ○ R30 ○ Bree Street. ○ R708. ○ R730. ○ R73. ○ Small Gravel Roads. 	<p>These roads are often subjected to heavy traffic and the use of heavy vehicle used in mining and should therefore be adequate for the transportation of the PV components, however, this should be determined by a suitable specialist.</p> <p>From a social perspective it is critical to ensure that along these road networks the correct safety measures are implemented to prevent the loss or injury of community members utilizing these roads. Additionally, mitigation measures are followed to ensure that traffic congestion or other similar impact do not impact on surround communities' quality of life in terms of road usage.</p> <p>These will provide access for the components of the solar PV to be transported along, as well as for the workers to gain access, it is therefore important that public transport exists along these routes.</p>	Positive social
Internal mine access/gravel roads	The area tends to be, at least to some degree already disturbed with some previous unknown activity taking place on areas within development footprint, accompanied along with this is roads which lends access to the site as well as the surrounding mining areas.	These areas are already disturbed and provided for valuable access to the site for evaluation. Additionally, these disturbed areas can be utilized for laydown areas or for the development of permanent internal access roads, therefore reducing the loss of vegetation on site.	Positive social
Private Agricultural holdings	Small agricultural holdings on the outskirts of the study area.	The development is primarily in mixed agricultural region. Development of the PV may pose a security risk and increase the rate for small petty crimes in the surrounding communities, this includes theft of items, livestock, produce, etc.	Negative Social
Abandoned buildings and built-up area	The area has abandoned infrastructure including abandoned or heavily degraded buildings which appear to have been used for housing of farming staff.	<p>These buildings are near the development footprint of the PV Facility</p> <p>These buildings could be utilized by the developer to provide temporary residence for developers or security. These buildings could also pose a security risk during construction for individuals using the access road or for locals in proximity and special attention must therefore be given to utilizing or securing these.</p>	Positive or Negative

Silos	Silos are commonly used for bulk storage of grain, coal, cement, carbon black, woodchips, food products and sawdust	No perceived social impact from the PV Development	
Mining areas	The majority of the larger study area, between is transformed by mining activity.	The majority of the study area as well as the development footprint has been influenced by mining activities and associated infrastructure, it is therefore safe to assume that the area is not fully classified as a Greenfields, which will limit the impact felt by the environment if development is approved. Additionally, the existing infrastructure allows for easy operation and integration of the solar PV facility into existing structures, such as the substation, social labour plans, security measures, etc.	Positive social
Protected areas	No perceived social impact		
Towns and Settlements	Theunissen is the largest town around which the mining settlements have established themselves.	Alternative employment opportunities will be provided to the local community members, although the employment opportunities are anticipated to be limited.	Positive social

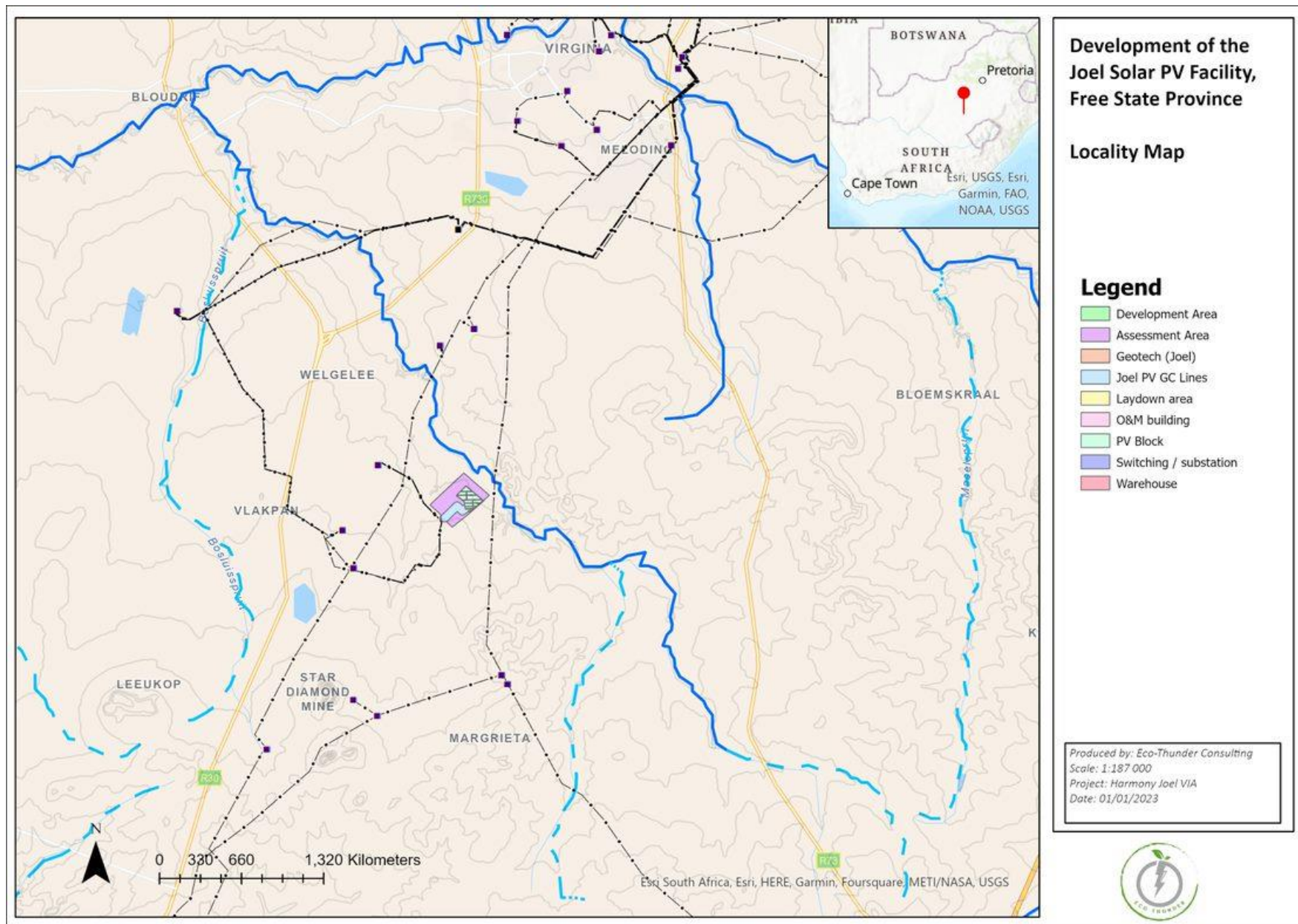


Figure 1: The proposed site of the Harmony Joel PV Facility

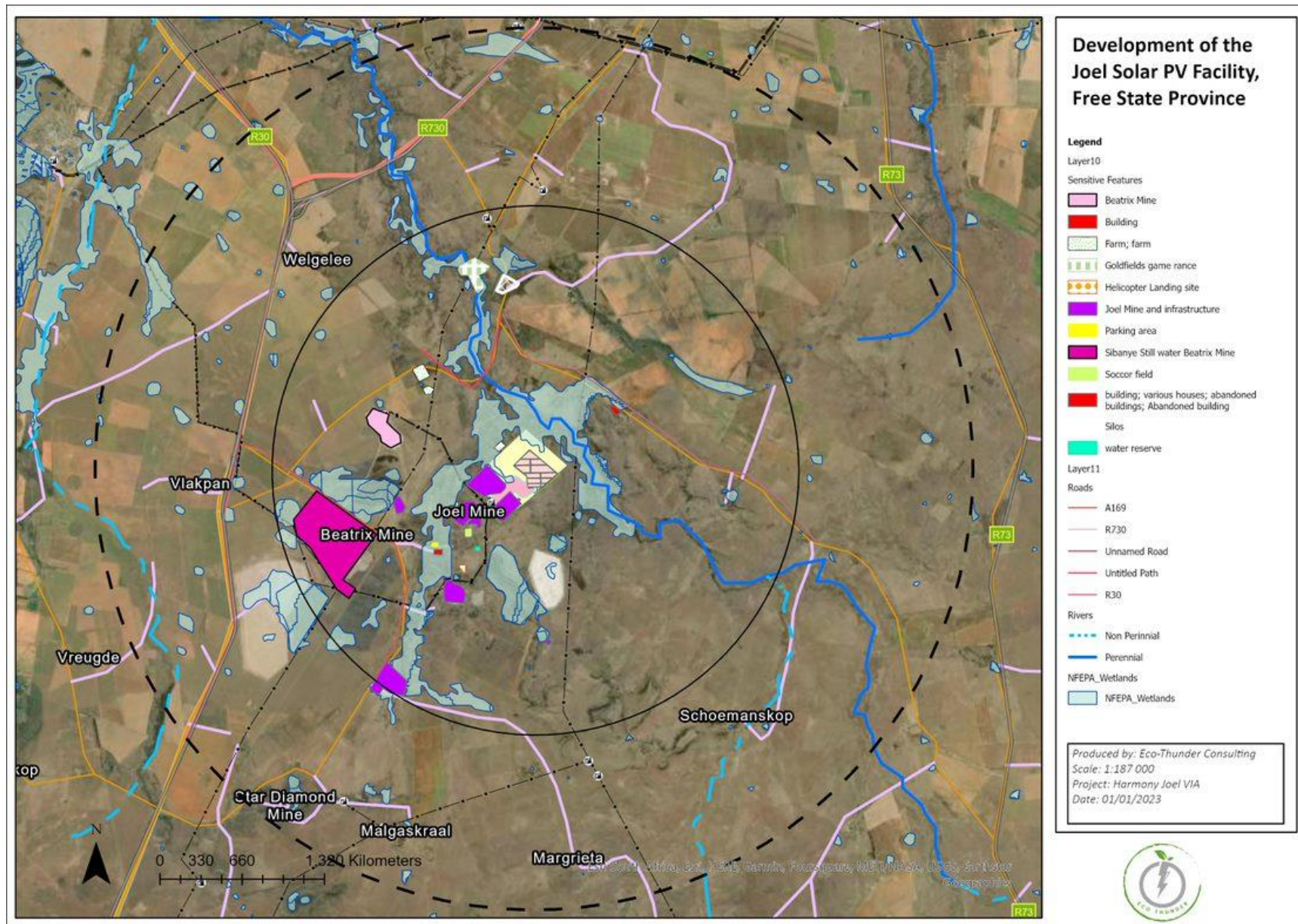


Figure 2: SIA features identified

2. METHODOLOGY AND APPROACH

2.1. Purpose of the Study

The International Principles for Social Impact Assessment define SIA as:

“The processes of analyzing, monitoring, and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions”.

The International Principles for Social Impact Assessment define social impacts as changes to one or more of the following:

- People’s way of life – that is, how they live, work, play and interact with one another on a day-to-day basis.
- Their culture – that is, their shared beliefs, customs, values and language or dialect.
- Their community – its cohesion, stability, character, services, and facilities.
- Their political systems – the extent to which people are able to participate in decisions that affect their lives, the level of democratisation that is taking place, and the resources provided for this purpose.
- Their environment – the quality of the air and water people use, the availability and quality of the food they eat, the level of hazard or risk, dust, and noise they are exposed to, the adequacy of sanitation, their physical safety, and their access to and control over resources.
- Their health and wellbeing – health is a state of complete physical, mental, social, and spiritual wellbeing and not merely the absence of disease or infirmity.
- Their personal and property rights – particularly whether people are economically affected, or experience personal disadvantage which may include a violation of their civil liberties.
- Their fears and aspirations – their perceptions about their safety, their fears about the future of their community, and their aspirations for their future and the future of their children.

The purpose of this SIA Process is therefore to:

- Provide baseline information describing the social environment within which the project is proposed, and which may be impacted (both positively and negatively) as a result of the proposed development.
- Identify, describe, and assess possible social risks/fatal flaws and social impacts that may arise as a result of the proposed development (in terms of the detailed design and construction, operation, and decommissioning phases of the project).
- Recommend ways in which negative impacts can be avoided, minimised, or their significance reduced, and positive impacts maximised or enhanced.

2.2. Assumptions and Limitations

2.2.1. Assumptions

- The identification of the proposed site was informed by technical information relating to local climatic conditions in the area, specifically annual rates of solar radiation, local topography, and land availability. It is therefore assumed that the project site identified fulfils the requirements for a suitable site to install a photovoltaic project with the outlined specifications.
- 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 development in terms of its fit with key planning and policy documents. As such, if 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 development, the development cannot be supported.
- It is assumed that the motivation for as well as the planning and feasibility study of the project was undertaken with integrity, and that information provided by the project proponent was accurate and true at the time of preparing this SIA Report.

2.2.2. Limitations

- This SIA Report was prepared based on information that was available to the specialist at the time of preparing the report. The sources consulted are not exhaustive, and the possibility exists that additional information which might strengthen arguments, contradict information in this report, and/or identify additional information might exist. Additional information available from the public participation undertaken during the BA process will be included and considered within the final report, where relevant.
- The socio-economic data presented in this study is largely based on Census information and data and research conducted or contracted by other levels of government. The quality of this data is compromised by the limitations associated with the Census data collection process.
- The census data is supported through additional data. The study draws primary data collected from towns/villages located in close proximity to the proposed project site. This additional information was collected through a survey of the communities within a 50km radius of the site. Limitation associated with this data include:
 - A small sample size.
 - Lack of qualitative data to support quantitative findings.

2.3. Assessment Criteria

Direct, indirect, and cumulative impacts associated with the projects must be assessed in terms of the following criteria:

- The nature, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The extent, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The duration, wherein it will be indicated whether:
 - the lifetime of the impact will be of a very short duration (0 – 1 years) – assigned a score of 1;
 - the lifetime of the impact will be of a short duration (2 – 5 years) – assigned a score of 2;
 - medium-term (5 – 15 years) – assigned a score of 3;
 - long term (> 15 years) – assigned a score of 4; or
 - permanent – assigned a score of 5;
- The magnitude, quantified on a scale from 0 – 10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The probability of occurrence, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1 – 5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The significance, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium, or high; and
- The status, which will be described as either positive, negative, or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula: $S=(E+D+M)P$

S = Significance weighting

E = Extent

D = Duration

M=Magnitude

P=Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30 – 60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

The summarizing of assessment impacts in a prescribed table format including the rating values as per above criteria. Measures for inclusion in the Environmental Management Programme.

3. POLICY AND PLANNING

This section introduces the relevant policies on various levels of government and their content. Relevant policy content is contained in the National White Paper on Renewable Energy, National Energy Act, Integrated Resources Plan for Electricity, and the National Development Plan (NDP).

The National Energy Regulator of South Africa (NERSA) and the Department of Energy (DOE) govern the energy sector's regulatory framework. Critical stakeholders further include the national utility Eskom, National Treasury, Department of Trade and Industry, and the Department of Economic Development

The legislative and policy context applicable to a project plays an important role in identifying and assessing the potential social impacts associated with the development. In this regard a key component of the SIA process is to assess a proposed development in terms of its suitability with regards to key planning and policy documents.

The following key pieces of documentation were reviewed as part of this legislation and policy review process:

National Policy and Planning Context:

- Constitution of the Republic of South Africa, 1996
- National Environmental Management Act (No. 107 of 1998) (NEMA)
- White Paper on the Energy Policy of the Republic of South Africa (1998)
- National Energy Act (No. 34 of 2008)
- Integrated Energy Plan (IEP) (2015)
- National Development Plan (NDP) 2030 (2012)
- Strategic Infrastructures (SIPs)

Provincial Policy and Planning Context:

- Free State Provincial Growth and Development Strategy (FSGDS) (2005 – 2014)
- Free State Provincial Growth and Development Strategy (FSGDS), Revised October 2007
- Free State Provincial Spatial Development Framework (PSDF) - Executive Summary (Inception Report)
- Free State Green Economy Strategy (2014)
- Free State Investment Prospectus (2019)

Local Policy and Planning Context:

- Lejweleputswa District Municipality Integrated Development Plan (IDP) 2020 / 2021
- Masilonyana Local Municipality Integrated Development Plan IDP (2020 – 2021)

3.1. National Planning and Policies

3.1.1. Constitution of South Africa

Section 24 of the Constitution pertains specifically to the environment. It states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to environmental impacts.

3.1.2. The National White Paper on Renewable Energy

In 1998, the White Paper on Energy Policy for South Africa (December 1998) identifies renewable energy as a future commercial opportunity for the country. "Government policy is based on an understanding that renewables are energy

sources in their own right, are not limited to small-scale and remote applications, and have significant medium and long-term commercial potential”.

The document argues that the abundant renewable energy resources have an important role to play in promoting sustainable energy security going forward. “Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future”.

3.1.3. National Energy Act

Government promulgated the National Energy Act in 2008 (Act No 34 of 2008). Next to other objectives, the Act sets out to promote diversity of supply of energy and energy sources. The preamble makes direct reference to this objective, emphasizing the importance of renewable resources, including solar:

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

3.1.4. Integrated Resource Plan for Electricity

The latest, promulgated Integrated Resource Plan was written in 2010. An updated version was released in 2013 for public comment. Both versions support the procurement of renewable energy. The 2010 version allocates 17.8 GW to renewables by 2030. The 2013 version stipulates that 2.2 GW shall be integrated into the grid, on an annual basis.

3.1.5. National Development Plan

The National Development Plan, which was adopted by government, makes various suggestions for the enhancement of energy and electricity infrastructure. The NDP, published in 2013, specifically supports the procurement of renewable energy. It stipulates a goal of a minimum of 20 GW to be procured by 2030.

3.2. Provincial Planning and Policy

The study site is located in the Free State Province. Relevant policy and planning documents on provincial level include:

3.2.1. Free State Provincial Growth and Development Strategy (FSGDS) (2005 – 2014)

The overarching goal of the Free State Growth and Development Strategy (FSGDS) is to align the provincial and national policies and Programmes and to guide development in terms of effective and efficient management and governance to achieve growth and development. The strategy is a living document that uses the latest business planning and evaluation tools in order to maximize the effect of all spending.

Based on the social and economic development challenges of the province, the Strategy identifies a few primary objectives, including stimulating economic development, developing, and enhancing the infrastructure for economic growth and social development, poverty alleviation through human and social development, ensuring a safe and secure environment for all, and the promotion of effective and efficient governance and administration.

The development of the agricultural and infrastructure development supports the overall objective of stimulating economic development and infrastructure investment towards growth and social development, by contributing to the energy mix, supply, and infrastructure of the province. The development of the facility will also contribute (albeit limited) to the alleviation of poverty through the creation of direct and indirect employment opportunities and skills development.

3.2.2. Free State Provincial Growth and Development Strategy (FSGDS), Revised October 2007

The revised FSGDS refers to specific imperatives which sets the tone and pace for shared growth and development in the province. These include:

- The need to effectively use scarce resources within the province, whilst addressing the real causes of development challenges.

- The need to accelerate service delivery based on a common provincial development agenda as the basis for provincial strategic direction.
- The need to identify investment opportunities and provide an environment of certainty, critical for private-sector investment.
- The need to promote intergovernmental coordination between the three spheres of government.
- The need to facilitate the implementation of the People's Contract within the Province.
- The need to provide a common vision as the basis for common action amongst all stakeholders, both inside and outside government.
- The need to provide a framework for budgets, implementation, performance management and spatial development.

The development of the agricultural and infrastructure development will assist with the need to effectively use scarce resources and the need to identify investment opportunities, including private sector-investment. The development of a solar facility reduces the need to make use of non-renewable resources for the generation of electricity and opens up the province to further future solar energy development.

3.2.3. Free State Provincial Spatial Development Framework (PSDF) - Executive Summary

The Free State PSDF is a provincial spatial and strategic planning policy that responds to and complies with the National Development Plan Vision 2030 and the National Spatial Development Perspective (NSDP). The latter encourages all spheres of government to prepare spatial development plans and frameworks (such as the PSDF) that promote a developmental state in accordance with the principles of global sustainability as is advocated by, among others, the South African Constitution, and the enabling legislation.

The Free State Provincial Growth and Development Strategy states that sustainable economic development is the only effective means by which the most significant challenge of the Free State, namely poverty, can be addressed. The PSDF gives practical effect to sustainable development, which is defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

The PSDF is prepared in accordance with bioregional planning principles that were adapted to suit the site-specific requirements of the Free State. It incorporates and complies with the relevant protocols, conventions, agreements, legislation, and policy at all applicable levels of planning, ranging from the international to the local.

The agricultural and infrastructure development will contribute to sustainable and economic development goals of the Free State PSDF, once completed, and formally adopted.

3.2.4. Free State Investment Prospectus (2019)

The Premier of the Free State provides individual investors' access to accurate and pertinent information which makes it easier for investors to glean investor ready opportunities that are currently available in the Free State.

Opportunity for the development of renewable energy is considered in the key sectors overview. The prospectus states that opportunities are opening up in the province for the energy sector, including renewable energy. Rezoning for the development of multiple solar energy facilities has already been undertaken in the province. The development of a Solar Park in the Xhariep region is seen as a driver of growth along the banks of the Orange River.

Considering the future opportunities available for the development of renewable energy facilities (including solar PV facilities) the development of the agricultural and infrastructure development is considered to be in-line with the Investment Prospectus of the Province.

3.3. District Level Planning and Policies

3.3.1. Lejweleputswa District Municipality Integrated Development Plan (IDP) 2020/2021

Lejweleputswa District Municipality main objectives according to its IDP is to promote economic development in the district to create jobs and wealth, reduce poverty levels and promote Lejweleputswa region as a commercial hub and also function as springboard for Private, Public Partnership (PPP) for the District. The vision for the district is to be a

leader in sustainable development and service delivery to all. Economic development opportunities are the key determinant of the settlement pattern as well as the distribution of industrial areas in the district. Economic development typically responds to the availability of environmental capital (e.g. water, suitable agricultural soil, mining resources, etc.) and infrastructural capital (e.g. roads, electricity, bulk engineering services etc.).

Under SPCF. Renewable Energy Structures the IDP refers to support by the district on any wind turbines or solar voltaic apparatus, or grouping thereof, which captures and converts wind or solar radiation into energy for commercial gain irrespective of whether it feeds onto an electricity grid or not. The Final Draft Free State Provincial Spatial Development Framework 2014 supports the NDP strategic priority which states that new large-scale infrastructure should be prioritized in settlements with high economic growth potential.

Currently the Solar Energy Hub in Virginia where projects are at Dealesville and Boshof should be promoted to expand into a solar energy hub for the south-western part of the district. The said towns are also indicated as solar energy nodes on the district sdf map.

3.3.2. Masilonyana Local Municipality Integrated Development Plan IDP (2020 – 2021)

The Masilonyana Local Municipality is committed to effective and transparent governance by being an integrated, safe and harmonious environment with effective service delivery to attract investors. It seeks to:

- a) Promoting economic development
- b) Providing sustainable services, and
- c) Improving the quality of life of all people.

Transition to low carbon energy is what the municipality IDP strives to achieve and speed up and expand renewable energy, waste recycling, ensure buildings meet energy efficient standards. As part of its integrated environmental management & Climate change the following needs to be achieved:

- Increase the environmental literacy levels of stakeholders
- Reduce the major sources of greenhouse gas emissions and digesting the large-scale supply of clean energy
- Energy saving

The Joel Solar PV Facility indirectly contributes to the overall climate change response plan of the district municipality by providing energy without reliance on fossil fuels and therefore exacerbating climate change at a provincial and national level.

For the mining sector the major challenges include the over-dependence of the local economies on mining. Linked to these key sectors is the need to consider youth development. The key issues pertaining to both the province and the MLM include:

- African youths are the majority in the Free State, and they are also the most disadvantaged. Consequently, all attempts at intervening on behalf of youths should mainly target the African youth.
- There is an inherent lack of skills particularly amongst the African and Coloured youths, which leads to high unemployment amongst these groups.
- Youths are both perpetrators and victims of wrong social behaviours. They are at risk of being exposed to risky sexual behaviour, HIV & AIDS, and being head of a household.

3.4. Conclusion

The review of relevant legislation, policies and documentation pertaining to the proposed development indicates that the establishment of the Solar PV Development and associated infrastructure is supported at a national, provincial, and local level, and that the proposed project will contribute positively towards a number of targets and policy aims.

4. OVERVIEW OF THE STUDY AREA

4.1. Overview of Study Area

This section outlines the relevant administrative context as well as the provincial socio-economic and municipal contexts. It closes with a description of the local context of the immediate surroundings of the proposed PV Facility site.

This chapter provides an overview of the socio-economic environment of the province, DM, and LM within which the Harmony Joel Solar PV Facility is proposed and provides the socio-economic basis against which potential issues can be identified.

The Free State Province is the landlocked core of the country. It is centrally placed, with good transport corridors to the north and the coast. It is the third biggest of South Africa's nine provinces in terms of size, and primary agriculture is a key economic sector. Mining is also important but has been declining steadily since 2008. Although the Free State is the third largest province in South Africa, it has the second smallest population and the second lowest of 129 825km² and has a population of 2 834 714. It covers an area 5.1% of the national population. Languages spoken include Sesotho (64.4%), Afrikaans (11.9%) and Zulu (9.1%). The Free State Province contributes 5.4% to South Africa's total gross domestic product (2006).

Agriculture is a key economic sector 8% of the country's produce comes from Free State. In 2010, agriculture provided 19.2% of all formal employment opportunities in the region. The economy is dominated by agriculture, mining, and manufacturing. Known as the 'breadbasket' of South Africa, about 90% of the province is under cultivation for crop production. It produces approximately 34% of the total maize production of South Africa, 37% of wheat, 53% of sorghum, 33% of potatoes, 18% of red meat, 30% of groundnuts and 15% of wool. The province is the world's fifth largest gold producer, with mining the major employer.

As part of the identification of the Key social issues the Harmony Joel Social Labour Plan was evaluated and, where applicable incorporated into the findings of this report.

4.2. Administrative Context of Study Area

The Harmony Joel Solar PV is located within the Masilonyana Local Municipality (MLM), which is one of five local municipalities that make up the Lejweleputswa District Municipality (LDM) in the Free State Province. The town of Welkom is the administrative seat for both the LDM and MLM.

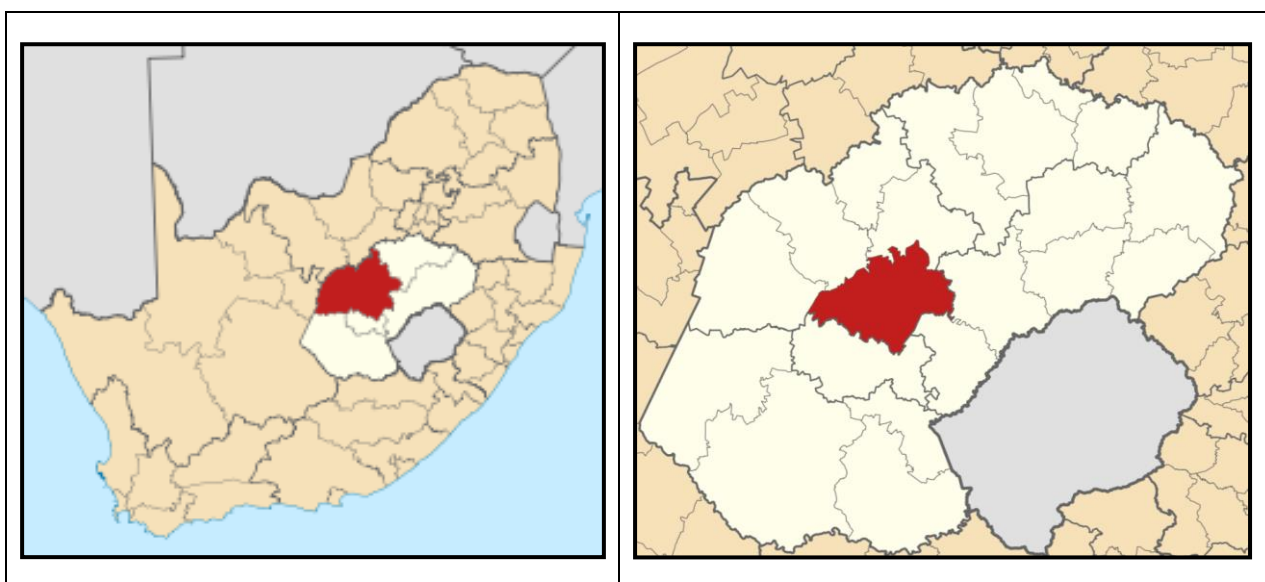


Figure 3: Location of Lejweleputswa District Municipality (left) and Masilonyana Local Municipality (right) within the Free State Province

Table 1: Spatial Context of the study area for the development of the Harmony Joel Solar PV

Province	Free State Province
District Municipality	Lejweleputswa District Municipality
Local Municipality	Masilonyana Local Municipality
Ward number(s)	6
Nearest town(s)	~ 20km north-east of the town of Theunissen
Current Zoning	Agriculture
Current land use	The properties both currently lie fallow, having been used historically for agriculture
Access	The site can be readily accessed via an existing gravel access road (Unnamed Rd Theunissen, Free State)

4.3. Provincial Socio-Economic Context

The proposed Solar Energy Facility is in the Free State Province which covers an area of 129 464 km², or 10.6% of the total land area of the country. The western part of the Free State is characterised by flat plains, pans, and undulating land. The south is primarily lowlands with hills. To the east the escarpment extends from Lesotho into low mountains and irregular undulating land with hills. The northern and central portions are marked by undulating land and hills. The climatic conditions range from moist and warm in the east to dry and warm in the west.

The province is the granary of South Africa, with agriculture central to its economy, while mining in the goldfield reefs is its largest employer.

Economic towns include Welkom, Kroonstad, Parys, QwaQwa, and Bethlehem. The Free State is the third- largest Province in South Africa, but it has the second-smallest population and the second-lowest population density. The culture is centered on traditional cultures but built on the influences of the early European settlers.

Close to 2.8 million people live in the Free State, with two-thirds speaking Sesotho, followed by Afrikaans, Zulu, Tswana, Xhosa and English.

The Free State is strategically placed to take advantage of the national transport infrastructure. Two corridors are of particular importance: the Harrismith node on the N3 corridor between Gauteng and KwaZulu-Natal, and the N8. The N1 connects Gauteng to the Western Cape. Bram Fischer International Airport in Bloemfontein handles about 250 000 passengers and 221 000 tons of cargo a year. Manufacturing also features in the provincial economic profile. This sector makes up 14% of the provincial output, with petrochemicals (via Sasol) accounting for more than 85% of the output.

The Free State Province comprises of four (4) Districts, namely Fezile Dabi, Lejweleputswa, Thabo Mofutsanyana and Xhariep (refer to Figure 4).

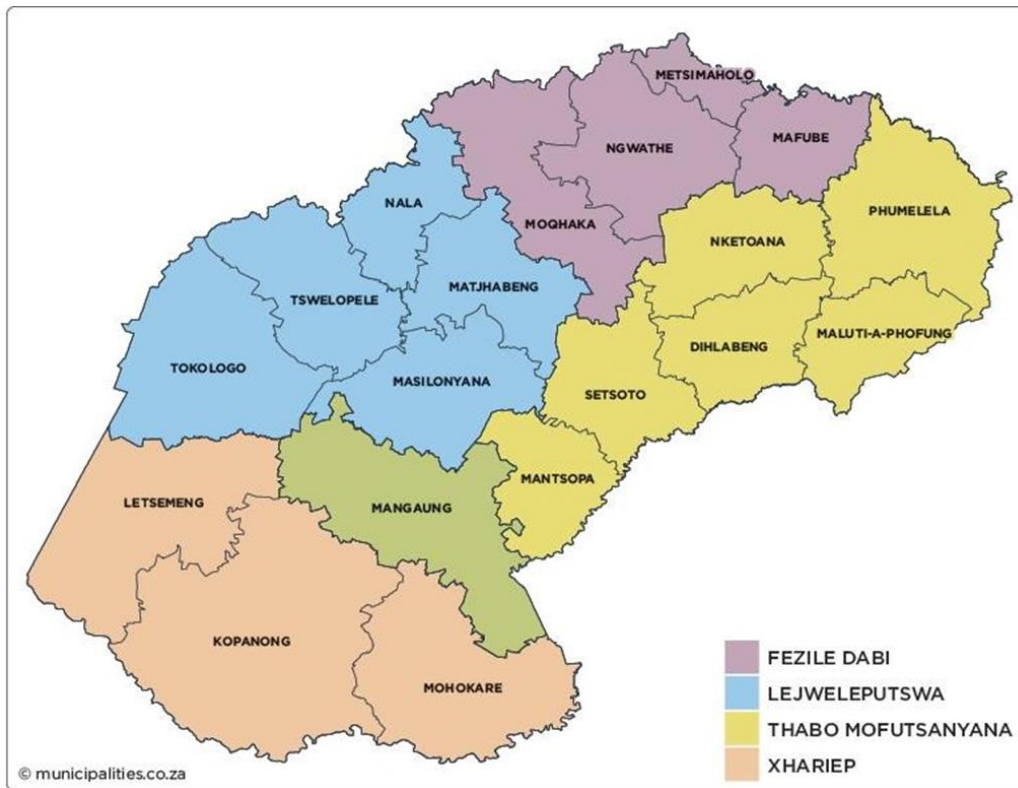


Figure 4: Map showing the districts of the Free State Province (Source: www.municipalities.co.za).

2.3.1. Population

The population of the Free State increased by an estimated 116 010 people, from 2.7 million in 2011 to 2.8 million in 2016, making it the second smallest increase after the Northern Cape (45 839). The proportion of the Free State's population to national total population decreased by 0.2 percentage points; from 5.3 percent in 2011 to 5.1 percent in 2016, which is the highest decline nationally. The negative change in the Free State's population in particular has severe consequences on the province's share of nationally raised revenue via the equitable share formulae. Because the formula is largely population-driven (over 60 percent of the formula uses population data), the allocations capture shifts in population across provinces. As a result, provinces with increased populations, like Gauteng, receive additional resources, while those with decreasing populations, like the Free State, receive reduced allocations.

Table 2: Population Structure of the District municipality

Province/district/local municipality	Census 2011	Community Survey 2016	Growth rate
DC16: Xhariep	121 945	125 884	0,7
FS161: Letsemeng	38 628	40 044	0,8
FS162: Kopanong	49 171	49 999	0,4
FS163: Mohokare	34 146	35 840	1,1
DC18: Lejweleputswa	624 746	646 920	0,8
FS181: Masilonyana	59 895	62 770	1,1
FS182: Tokologo	28 986	29 149	0,1
FS183: Tswelopele	47 625	47 373	-0,1
FS184: Matjhabeng	407 020	429 113	1,2
FS185: Nala	81 220	78 515	-0,8
DC19: Thabo Mofutsanyana	735 679	779 330	1,3
FS191: Setsoto	112 038	117 362	1,1
FS192: Dihlabeng	128 704	140 044	1,9
FS193: Nketoana	60 324	64 893	1,7
FS194: Maluti-A-Phofung	335 784	353 452	1,2
FS195: Phumelela	47 772	50 054	1,1
FS196: Mantsopa	51 056	53 525	1,1
DC20: Fezile Dabi	488 036	494 777	0,3
FS204: Metsimaholo	149 108	163 564	2,1
FS205: Mafube	57 876	57 574	-0,1
FS201: Moqhaka	160 532	154 732	-0,8
FS203: Ngwathe	120 520	118 907	-0,3
MAN: Mangaung	775 184	787 803	0,4
Free State	2 745 590	2 834 714	0,7

The figure below shows the population structure of the Free State in 2016 by means of a population pyramid. Population pyramids are graphical representations of the age and sex of a population. The age-sex structure of any population affects the labour force, demand for education facilities, retirement and medical systems amongst others. Therefore, the population pyramid provides crucial data that can be used by the government when planning. The Free State has what is called an expansive population pyramid. Expansive population pyramids depict populations that have a larger percentage of people in younger age groups. Populations with this shape usually have high fertility rates with lower life expectancies. The implications of such a structure is excessive strain on the economically active population. The pyramid narrows toward the top because the death rate is higher among older people than among younger people. Free State’s population pyramid depicts the characteristics of a developing nation which are: (i) low growth rates, (ii) high birth rate, and (iii) short life expectancy

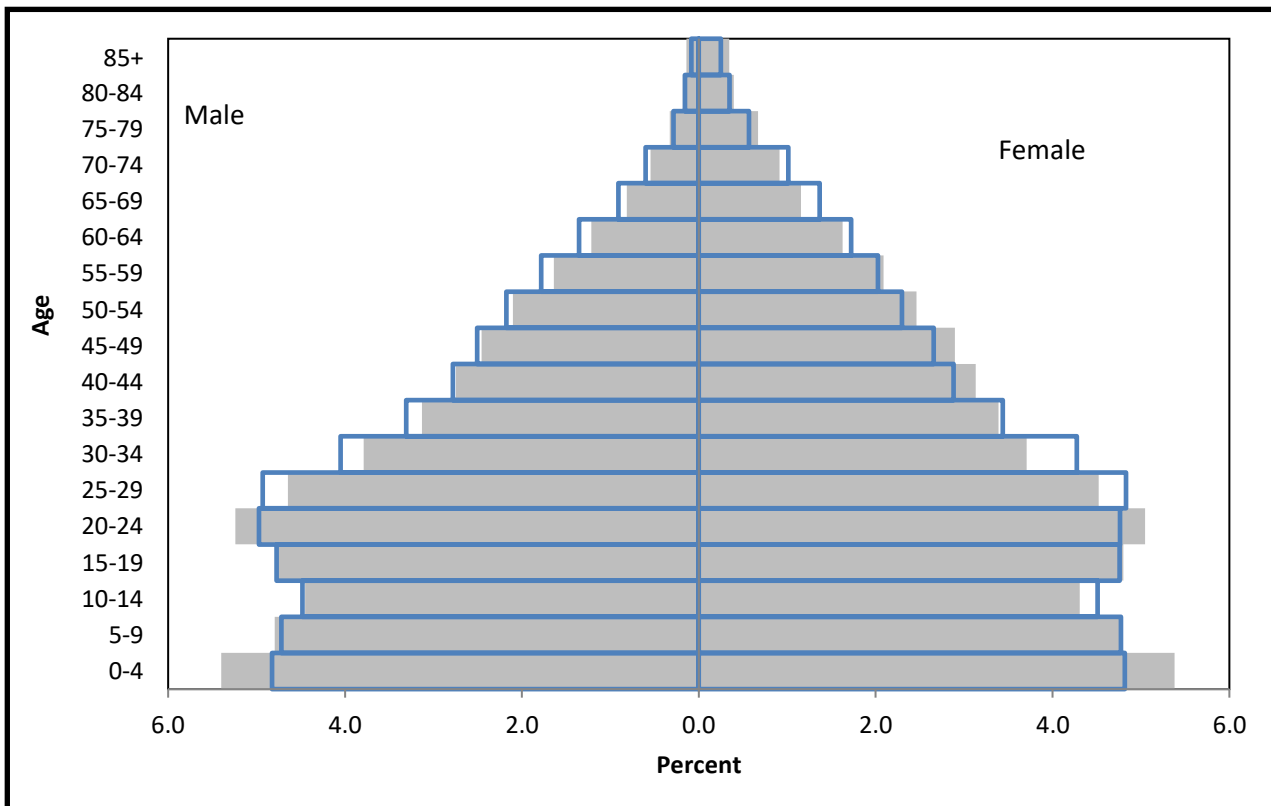


Figure 5: Population pyramid of the study area

2.3.2. Economy

The economy of the Free State faced several headwinds in 2016, in line with some the challenges faced by the global, regional and national economies. The El Nino episode, which resulted in the drought experienced by Southern Africa (including the South Africa and the Free State), infiltrated into the beginning of 2016. This drought resulted in less grain being planted throughout the country, which resulted in the need to import grain during 2015 and 2016. Coupled with a weaker domestic currency, the drought fueled food inflation to double digit territory, and negatively impacted consumer and business confidence in 2016.

The table below shows that the Free State economic output is anticipated to expand from R159.9 billion in 2016 to R160.3 billion in 2017 and grow further to R167.3 billion in 2020. Following a similar trend, all industries in the provincial economy are projected to grow by 0.3 percent in 2017 and accelerate further to grow by 1.7 percent in 2020. The agricultural industry of the province is projected to recover from reducing by 7.2 percent in 2016 to expand by 0.5 percent in 2017.

As the second biggest producer of maize and wheat in the country, Free State agriculture will benefit from more rainfalls in 2017. The downside risk faced by the industry includes the presence of army worms, which can destroy harvest and disrupt food security for the province. However, the agricultural industry is projected to recover and grow by 1.7 percent in 2020. The other half of the primary industries, mining industry, is also projected to recover from a decline of

4.5 percent in 2016 to a growth of 2.6 percent in 2017.

As an energy-intensive industry, mining will benefit from the continuous and reliable supply of electricity. Also, gold and coal prices showed signs of recovery in 2016, which is a positive for the province. In the medium term, the growth rate of the mining industry in the Free State is projected to decline from 0.9 percent in 2017 to 0 percent in 2020. In the secondary industries, the output of the electricity industry is projected to decline by 0.1 percent in 2017, and thereafter recover and reach 2.9 percent in 2020. In South Africa, hydroelectricity was reduced in 2016 following the drought and even in the mist of rainfalls, the water sub-industry might recover gradually in 2017.

The construction industry continues to be disadvantaged by fiscal consolidation as well as weak private investment and over the medium term, the industry is projected to reduce by an average of 0.2 percent per annum. In the tertiary industry, increased global protectionism and uncertain trade policies are anticipated to have a negative bearing on the trade industry, which is projected to decline by 0.3 percent in 2017. However, favourable trade policies from the EU and anticipated from the UK may favour the tertiary industry of the province, which is projected to recover and grow by 1.6 percent in 2020.

The transport industry, which is projected to grow by a minute 0.1 percent in 2017, is projected to grow more robustly over the medium term by 3.1 percent in 2020. The national and provincial government continues to support the development and maintenance of transport infrastructure in the province e.g. public sector investment in mixed-use Airport Development Node as well as the 2nd phase of the Integrated Public Transport Network in the Mangaung region.

Table 3: GDP per sector from 2014-2020 for the Free State Province

R'1000	2014	2015	2016	2017	2018	2019	2020
Gross Domestic Product	160 328 010	161 027 129	159 866 989	160 291 315	162 062 529	164 400 919	167 312 446
Total Industries	1.9%	0.4%	-0.6%	0.3%	1.0%	1.4%	1.7%
GDPR by Industry (real change)							
Agriculture	6.7%	-7.1%	-7.2%	0.5%	0.5%	0.9%	1.7%
Mining	2.2%	1.6%	-4.5%	2.6%	0.9%	0.9%	0.0%
Manufacturing	2.6%	-0.2%	1.5%	-0.1%	1.1%	1.1%	1.3%
Electricity	-0.6%	-1.3%	-1.8%	-0.1%	1.2%	2.2%	2.9%
Construction	2.2%	0.5%	-0.9%	0.1%	-0.2%	-0.4%	0.0%
Trade	1.1%	0.8%	-0.6%	-0.3%	0.9%	1.1%	1.6%
Transport	2.7%	0.6%	-0.7%	0.1%	1.8%	2.0%	3.1%
Finance	1.5%	1.7%	0.6%	0.3%	2.0%	2.1%	2.5%
Community services	1.5%	0.5%	1.4%	-0.3%	0.4%	1.6%	2.1%

2.3.3. Employment

The International Labour Organization (ILO) (2017) highlighted that the global economy grew by 3.1 percent in 2016, which is the lowest economic growth rate in the past six years. Although the global economy is projected to recover and grow by 3.4 percent in 2017, global uncertainties such as increased trade protectionism pose downside risks to the global economic outlook. In the context of a subdued global economy, the ILO raises concerns in the labour market, such as will a sufficient number of jobs be created; will the quality of the jobs in existence be improved; and lastly will the gains from growth be inclusively distributed? The ILO expects unemployment to remain high in the medium term, which will be worsened if labour force growth outstrips job creation.

According to Statistics South Africa the province has the highest unemployment rate in the country (34.7 percent in Q4:2016) and approximately 68 000 jobs were lost in 2016. An estimated economic growth rate of 0.3 percent in 2017 will make it very difficult for the province to create sufficient jobs to reduce the high unemployment rate of the province. According to Statistics South Africa (2017) the labour force of the Free State has declined by 16 000 (or 1.4 percent) between Q4:2015 and Q4:2016. Over the review period, employment drastically declined by 68 000 (or 8.2 percent), whilst the number of unemployed individuals increased by 52 000 (or 14.7 percent). As indicated in table 3 above, the official unemployment rate of the province increased from 29.8 percent in Q4:2015 to 34.7 percent in Q4:2016, which represents a 4.9 percentage point increase.

As indicated in the economy section above, the provincial economy faced several headwinds in 2016 which included drought in the agricultural and water industries, low commodity prices in mining, subdued global and national economies, fiscal consolidation, as well as reduced consumer and business confidence. These are among several factors which may have plummeted the provincial economy into negative growth territory in 2016 and subsequently increased the provincial unemployment rate.

Employment in South Africa increased by 51 000 (or 0.3 percent) between Q4:2015 and Q4:2016. However, employment in the country increased by 235 000 between Q3: 2016 and Q4: 2016, boosted mainly by community services (73 000), transport (46 000) and manufacturing (44 000) industries. In terms of provinces, the biggest gains in employment, year-on-year, occurred in Limpopo (103 000), Eastern Cape (36 000) and Gauteng (22 000). The biggest losses in employment over the same period occurred in Free State (68 000), Mpumalanga (36 000) and Northern Cape (14 000). Quarter to quarter changes reveal that the largest gains in employment occurred in Western Cape (70 000), Limpopo (64 000) and North West (60 000). Over the same period, the largest losses in employment occurred in Free State (24 000), Mpumalanga (19 000) and Northern Cape (10 000).

2.3.4. Human Development

HDI for both the Free State and South Africa has been steadily increasing for the period of 2005 to 2015. Historically, the HDI for the province has always been lower than that of the country. Despite this, HDI has been on an increasing trend moving from 0.51 in 2005 to 0.63 in 2015. This increase in the HDI might be due to the increasing trend in life expectancy and education in the same period despite the low prosperity of the economy. This increase shows that the social and economic development in the province is moderate. Overall, the different variables indicate that the province is still on the right track to deliver improved services to its residents.

2.3.5. Education

During the period 2011 to 2016, the number of learners at ordinary schools increased for both the country and the province. Provincially, the number of learners increased by 30 339 learners, from 658 010 in 2011 to 688 349 in 2016, whilst for the country it increased by 644 571 learners, from 12 287 994 in 2011 to 12 932 565 in 2016. The number of learners has increased at a faster annual average rate of 1.03 percent nationally compared to 0.91 percent provincially. Free State's share of learners decreased from 5.4 percent in 2011 to 5.3 percent in 2016; a decline of 0.1 percentage point.

Table 4: Education per Free State District

District and local municipality	Census 2011		CS 2016	
	Number	%	Number	%
Xhariep	31 103	69,8	33 192	69,4
1FS161: Letsemeng	9 084	65,6	9 574	62,3
FS162: Kopanong	12 374	71,2	12 753	70,7
FS163: Mohokare	9 646	72,4	10 865	75,4
Lejweleputswa	158 066	70,7	170 825	73,6
FS181: Masilonyana	14 768	70,1	16 286	71,5
FS182: Tokologo	7 001	66,5	7 392	69,6
FS183: Tswelopele	13 031	69,7	14 104	75,1
FS184: Matjhabeng	101 830	71,5	110 623	73,5
FS185: Nala	21 435	69,4	22 419	76,6
Thabo Mofutsanyana	218 696	75,0	244 043	76,7
FS191: Setsoto	32 339	73,8	36 814	78,0
FS192: Dihlabeng	33 843	73,5	39 992	75,7
FS193: Nketoana	17 259	73,2	19 450	74,0
FS194: Maluti-A-Phofung	108 045	77,3	117 193	77,9
FS195: Phumelela	13 325	71,2	14 890	72,1
FS196: Mantsopa	13 885	71,0	15 704	75,4
Fezile Dabi	121 309	72,3	123 960	71,8
FS204: Metsimaholo	35 503	71,8	40 014	72,1
FS205: Mafube	16 580	74,0	16 243	73,3
FS201: Moqhaka	37 396	71,1	38 284	72,3
FS203: Ngwathe	31 829	73,6	29 418	70,0
Mangaung	206 827	74,0	231 996	77,5
Free State	736 002	73,1	804 016	75,2

2.3.6. Income and poverty

A study by the Free State Provincial Treasury on poverty and inequality (G.G Mashibini and O.S Omoshoro-Jones, 2016) found that poverty rates in the province have declined (using all three poverty lines), but the level remains high, as also seen in figure 6 below. The improvement is mostly attributable to a redistributive fiscal policy and average income growth. The study further states that poverty severity is substantially higher in rural areas than urban, which could be triggered by rural-urban migration.

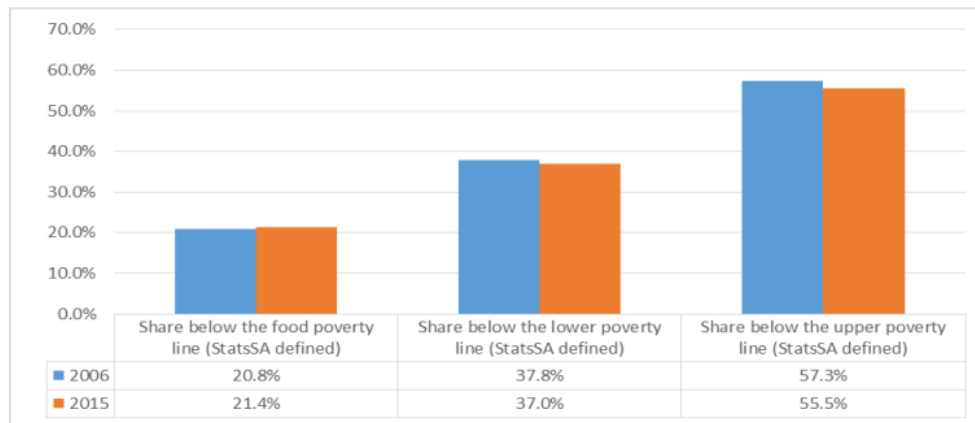


Figure 6: Poverty Within the District Municipality

4.4. Lejweleputswa District Municipality

Lejweleputswa District Municipality is situated in the mid-western part of the Free State province, with an estimated area of about 31 930 km² (Local government handbook, 2013). The district borders the North West province to the north, Fezile Dabi District Municipality to the north-east, and Thabo Mofutsanyane District Municipality to the east. It also borders Mangaung Metro and Xhariep District to the south and the Northern Cape Province to the west. It consists of 22.9% of the Free State province’s population, down from 26.7 % in 1996 (IHS Global Insight, 2015). The District is made up of five local municipalities, namely; Matjhabeng, Tokologo, Tswelopele, Nala and Masilonyana with about 17 towns.

The district's economy is heavily reliant on the gold mining sector, which is dominant in two of the municipalities, Matjhabeng and Masilonyana, while agriculture dominates the other municipalities. The district's economy is less diverse, relying heavily on the mining and community service sectors as its largest employers. Matjhabeng is the district's largest municipality and contributes the most GVA-R. According to IHS Global Insight, the district's average annual GDP-R growth rate was -1.5 percent in 2014 and is expected to fall even further to -2.9 percent in 2016 due to low international commodity prices and a persistent drought in the agricultural sector. Agriculture output is expected to fall and agricultural prices to rise as a result of low output levels, according to the South African Reserve Bank's monetary policy statement for the country in September 2015.

The Lejweleputswa District Municipality has five municipalities within its district (refer to figure 7).



Figure 7: Local Municipalities of Lejweleputswa District Municipality Source: (Local Government Handbook, 2015)

2.4.1. Population

With an annual population growth rate of 1.5 percent, the district has a population of 634 462 in 2019. This is 22 % of the total population of the Free State Province.

Based on the present age-gender structure and the present fertility, mortality and migration rates, Lejweleputswa's population is projected to grow at an average annual rate of 0.3% from 634 462 in 2019 to 644 000 in 2024.

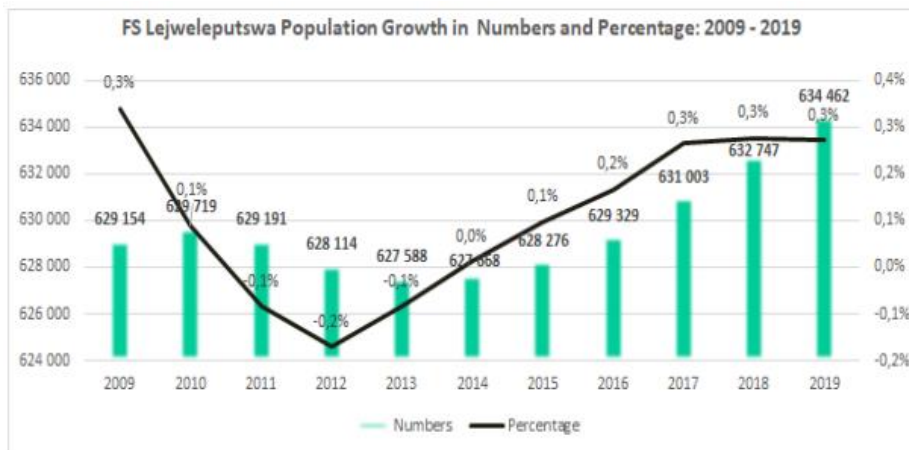


Figure 8: Predicted population growth 2009 -2019

2.4.2. Economy

The economy of Lejweleputswa thrives on mining and farming. The district is rich in gold deposits and lies at the heart of the province’s goldfields. In terms of farming, the district is a major producer of maize and sunflower. Mining and farming as the primary sector of the economy in the district contributed 28.6%. Activities in the secondary sector (manufacturing: 6.9%, electricity: 1% and construction: 5.7%) collectively contributed 13.6% to the GVA of the district. The tertiary sector (trade: 22.7%, transport: 4.4%, finance: 9.9% and community services: 20.8%) accounts for 57.8% of the GVA of the district. Economic activities in the tertiary sector comprises of finance, insurance, real estate and business services, wholesale and retail trade, catering and accommodation and general government sectors.

In recent years the contribution of mining in Lejweleputswa’s economy has been declining due to a number of reasons and recently the effect of lower world commodity prices has fueled the decline of the sector. The share of the primary sector is illustrated below in the Lejweleputswa Economic Sector. Lejweleputswa’s GVA has also been on a decline, indicating a shift away from the primary sector to the tertiary sector. The community services sector is growing strongly in all of Lejweleputswa’s municipalities and is also forecasted to grow further.

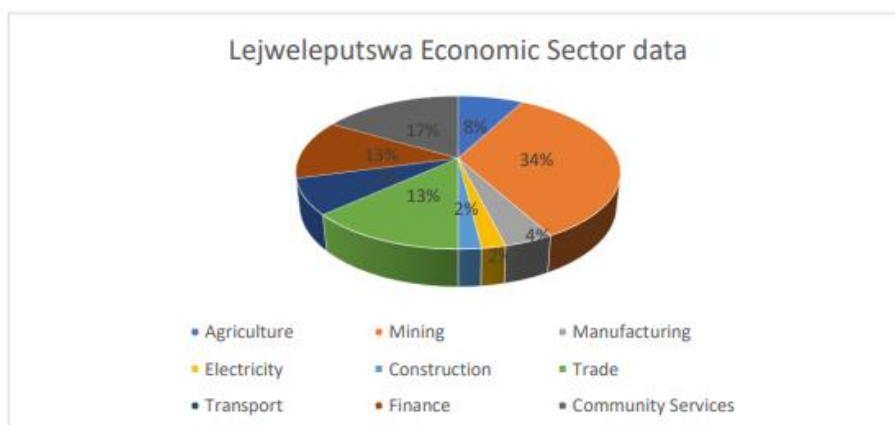


Figure 9: District municipality Economic Sector

2.4.3. Employment

Lejweleputswa employed 142 000 people in 2019, accounting for 18.26% of total employment in Free State Province (779 000) and 0.87% of total employment in South Africa (16.4 million). From 2009 to 2019, employment in Lejweleputswa fell at an annual rate of -1.63% on average. The trade sector employed the most people in the

Lejweleputswa district municipality in 2019, accounting for 28 400 people, or 20.0% of total employment in the district municipality. With a total of 26 400 (18.6%), the community services sector employs the second most people in comparison to the other sectors. The electricity sector employs the fewest people in Lejweleputswa District Municipality, with 1 320 (0.9%), followed by the transport sector, which employs 5 560 (3.9%). Between 2008 and 2018, both formal and informal employment in Lejweleputswa fell by 17 720 people. This decline was primarily caused by job losses in the mining and agricultural sectors. In 2019, there were 137 000 unemployed people in Lejweleputswa, a 61 800-person increase from 75 100 in 2009. The total number of unemployed people in Lejweleputswa accounts for 33.17% of all unemployed people in Free State Province. According to IHS Markit Regional eXplorer version 1946 (2019), the Lejweleputswa district municipality had a 50.9% unemployment rate in 2019. Lejweleputswa is one of the worst municipalities in the Free State province, with the highest rate of unemployment. When comparing unemployment rates among municipalities within the Lejweleputswa district municipality, Matjhabeng local municipality has the highest rate of 55.3%, up from 31.9% in 2009. In 2019, the Tokologo local municipality had the lowest unemployment rate of 26.1%.

2.4.4. Education

According to Community Survey (2016), 68% of young people completed Grade 9 or higher and 37,4% completed matric or higher

However, in 2019, 18 900 people (aged 15 and older) in the Lejweleputswa district had no education, while 83.9% (aged 15 and older) of the population had completed primary school. The number of unschooled people in Lejweleputswa district municipality accounts for 19.67% of the total number of unschooled people in the province and 0.85% of the national total. In 2019, the number of people with matriculation in Lejweleputswa district municipality was 114,000, accounting for 21.61% of the province's total number of people with matriculation. The province's proportion of people with a matric and a postgraduate degree is 16.25%, while the national proportion is 0.75%. 114,000 people aged 15 and up completed secondary education, accounting for 21.6% of the provincial population. The district's matric pass rate in 2019 was 87.8%, which is comparable to the province's other districts. In 2018, the district had 241 schools in ten circuits (19.8% of the province) and 157 321 students (22% of the province), indicating high population density and potential school overcrowding (Department of Basic Education, 2017/18 Annual Report). In terms of higher education, the Lejweleputswa District Municipality has one TVET college (Goldfields TVET College). Goldfields TVET College is one of South Africa's fifty registered and accredited public TVET colleges. It is spread across three campuses and one satellite campus in the Lejweleputswa District Municipality. The college provides a diverse range of business and engineering courses and programs. The Free State University (UFS) has two satellite campuses, one in Thabo Mofutsanyane and one in Welkom, Lejweleputswa.

2.4.5. Income and poverty

The South African Multidimensional Poverty Index (SAMPI) head count poverty rate in Lejweleputswa is 3%, down from 6% in 2011. In 2019, the Lejweleputswa District has 45.9% of its inhabitants living below the poverty line, according to IHS Markit (Global Insight). This is worse than the provincial average of 44%. Apart from poverty, the Lejweleputswa district outperformed the country on the following indicators: Household Income Growth of 6.7% (South Africa – 5.7%), Increase in Informal Employment of 18.6% (national 17.7%), and Productivity Growth of 0.2% (national -0.1%) over a 10-year average (Cooperative Governance and Traditional Affairs, 2020). In 2019, the Gini coefficient in Lejweleputswa District Municipality was at 0.62.

4.5. Masilonyana Local Municipality

Masilonyana Local Municipality is named after the mountain in the area. It is one of five municipalities in the district extending over 6 618km². It is situated between the province's biggest municipality, Mangaung Metro, in the south and the second- biggest municipality, Matjhabeng, in the north. The municipality is a result of the merging of former Transitional Local Councils which included Theunissen, Brandfort, Winburg, Soutpan and Verkeerdevlei.

It is an impoverished semi-urban area with a high unemployment rate. The municipality plays host to two toll plazas on two major roads in the province; the Verkeerdevlei Plaza on the N1 is the last before entering Bloemfontein from the north, and the Brandfort Plaza on the former R30 (now ZR Mahabane Road) is situated between Brandfort and Bloemfontein.

The Masilonyana Municipal area consists of the following towns:

- Brandfort
- Soutpan
- Theunissen
- Verkeerdevlei
- Winburg

Brandfort is also known for its rich political history, which includes the National Military Museum on a farm that used to be a concentration camp during the Anglo-Boer War and the Winnie Mandela House, where Mandela was sentenced to House Arrest during the State of Emergency in the 1980s. Theunissen is also situated on the ZR Mahabane Corridor between Bloemfontein and Welkom, and hosts the three mines within the municipal jurisdiction. Winburg has economic potential because of its location, which is 100km west of Bloemfontein, and its linking of Bloemfontein with Johannesburg, Cape Town and Durban. It prides itself with the Voortrekker Monument as its Heritage Site, and Masilonyana boasts several game reserves across all its towns. The municipality prides itself on its tourist destinations, such as the Florisbad National Quaternary Research Station. This is where the first human skull was discovered. There are also cooperatives in Soutpan working on the salt lakes to produce salt. The key economic sectors are agriculture, mining, and community services. The Municipality also experienced the highest tourism spending that increased from 3.9% in 2008 to 5.1% in 2017.

2.5.1. Population

According to CS 2016, there were 62770 persons living in the Masilonyana LM area of jurisdiction translating into 21558 households; 89.1% of the population belongs to the Black African population group, 9.8% to the White population group, 0.9% to the Coloured population group and 0.2% to the Asian/Indian population.

Table 5: Population and population interdenatal growth of Masilonyana Local Municipality

	Total population	Population interdenatal growth (2011 - 2016)
Census 2011	59 895	2 875
CS 2016	62 770	

Table 5 above shows population of Masilonyana local municipality and population interdenatal growth. This municipality has shown a population growth from 59 895 residents in 2011 to 62 770 in 2016, population has increased between 2011 and 2016 with interdenatal growth of 2 875 thousand.

2.5.2. Economy

The economy of Masilonyana Local Municipality is heavily reliant on the mining sector, although the sector’s share is on a decline. The mining sector contributed about 52.4% to the municipality’s economic output in 2016. The second largest sector was the community services (15.0%) followed by finance (8.5%) and trade (7.4%). On the other end of the spectrum, the smallest sectors were electricity and water (1.6%), construction (1.7%) and manufacturing.

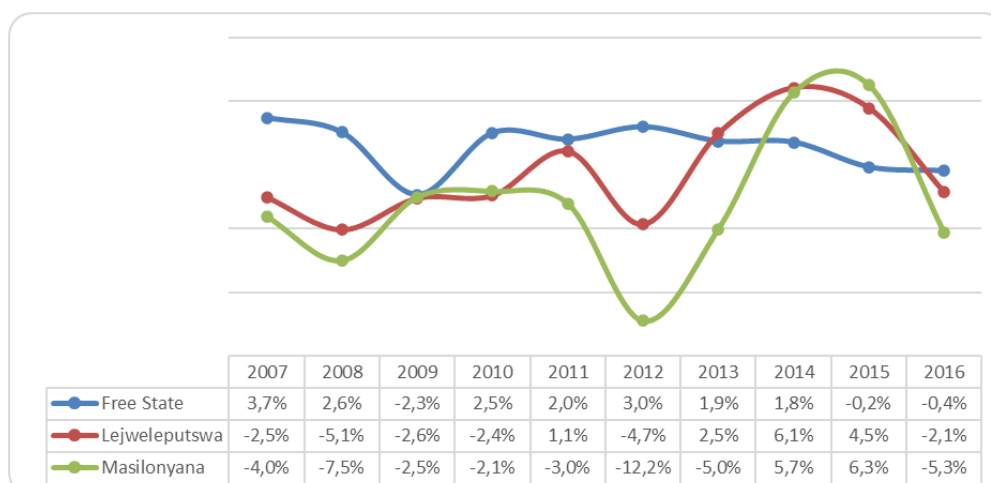


Figure 10: GDP growth rates by region

In terms of economic sectors, the economic outlook for Masilonyana is a bit dismal. In 2016, all sectors in the economy contracted with the worst performing being in the primary industries, which happen to be the biggest industry in the municipality's economy. The biggest sectors in the economy, mining and community services, contracted by 14.1% and 1.5% respectively. In order to rescue the economy from this sustained period of negative growth, these two sector must begin to grow positive.

2.5.3. Employment

Unemployment is without a doubt one of the biggest challenges facing the Free State Province. During the period 2007 to 2016, the unemployment rate in the Free State averaged 29.6%. The Lejweleputswa District's unemployment rate averaged 33.7% during the same period, whilst that of Masilonyana averaged 37.8%. According to IHS Global Insight (2017), Masilonyana had the highest unemployment rate within the Lejweleputswa District, followed by Matjhabeng (33.5%), Nala (34.3%), Tswelopele (33.2%) and Tokologo (28.4%) respectively

The biggest employers in the municipality of Masilonyana in 2016 were trade (22%), community services (19%), agriculture (16%) and private households (14%). On the other hand, the smallest employers were electricity and water (1%), transport (3%), construction (4%), and manufacturing (6%). It is interesting to note that although the mining contributes over 50% to economic output, it only contributes 8% to employment.

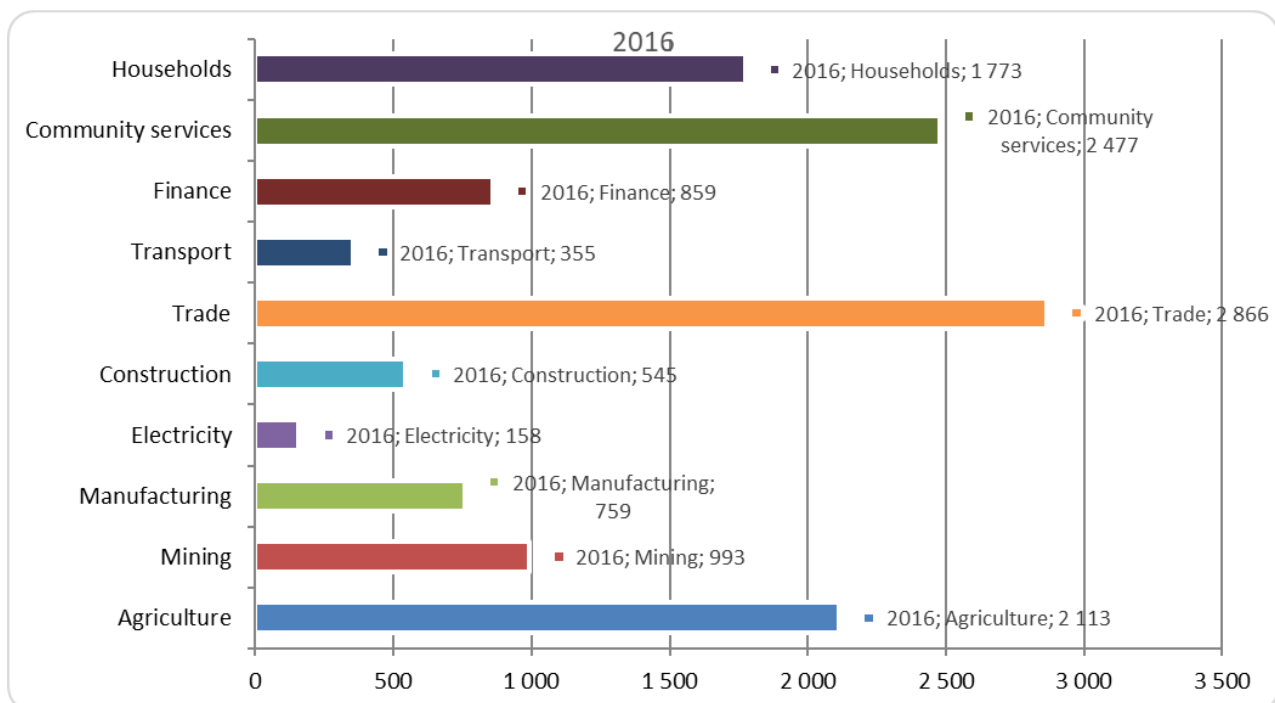


Figure 11: Overview of Employment Statistics in the study area

2.5.4. Education

Figure 12 presents percentage distribution of population aged 20+ years by highest level of education of Masilonyana local municipality. It shows that among population aged 20 years and above, a significant decrease of 12 percent of population reported to have no schooling from 19.5 percent in census 1996 to 7.5 percent in census 2011 respectively. The figures further show an increase of 5.4 and 7.9 percent among the population reported to have some secondary and matric education in 2001 and 2011 censuses respectively.

Percentage distribution of population aged 20+ by highest level of education, Masilonyana: 1996-2011

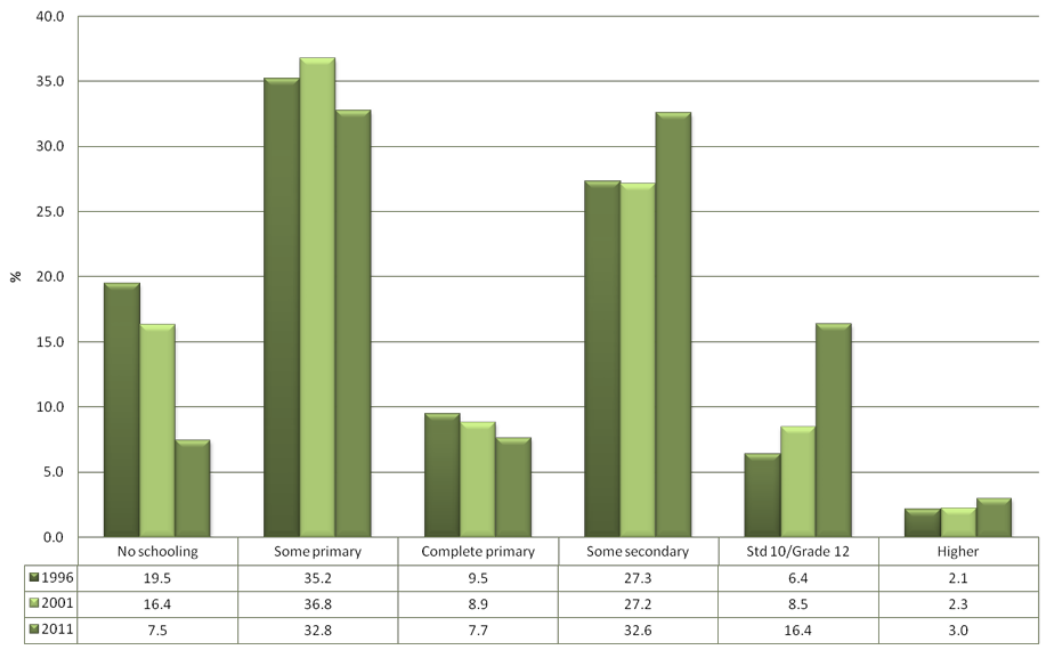


Figure 12: Overview of Education Distribution in the study area

5. ASSESSMENT OF KEY SOCIAL ISSUES AND IMPACT

5.1. Introduction

Section 5 identifies the key social issues identified during the SIA study. The identification of social issues was based on:

- Review of project related information, including other specialist studies;
- Application of relevant Legislation from a local to national level;
- Experience of the authors of the area and the local conditions; and
- Experience with similar projects.

In identifying the key issues the following assumption is made:

- The area identified for the proposed Solar PV Facility meets the technical criteria required for such facilities.

This Chapter provides a detailed description and evaluation of the potential social impacts that have been identified for the detailed design and construction, operation, and decommissioning phases, of the proposed Harmony Joel Solar PV.

This assessment considered the following points:

- The nature, extent, and significance of the features within the social landscape being considered.
- The existing disturbance already present within the social landscape (i.e., mining activities and other industrial developments/infrastructure).

Social impacts are expected to occur during both the construction and operation phases of the Harmony Joel Solar PV. The status of the impacts will either be positive or negative and either mitigation or enhancement measures are recommended for the management of the impacts, depending on the status of the impacts.

5.2. Identification of Key Social Issues

The identified key social issues are discussed below. They are divided into policy and planning related, and local and site-specific issues. Local and site-specific issues are further divided into construction and operational related issues.

A Social Impact Assessment has been compiled in order to provide a description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed facility; to provide a description and assessment of the potential social issues associated with the proposed facility; and the identification of enhancement and mitigation aimed at maximizing opportunities and avoiding and or reducing negative impacts

As part of the identification of the Key social issues the Harmony Joel Social Labour Plans were evaluated and, where applicable incorporated into the findings of this report.

A Social and Labour Plan (SLP) (**Please see appendix B for the latest SLP**) is a document that sets out the commitments a mining company makes to its employees and impacted communities and how and when these objectives will be achieved. Every company is required by law – in this case Regulation 42 of the Minerals and Petroleum Resources Development Act (MPRDA) – to devise and submit a SLP to the Department of Mineral Resources and Energy (DMRE) as a pre-requisite for the granting of a mining right. SLPs are normally required to be revised and resubmitted every five years during the life of a mining right.

The main question which needs to be addressed is:

“How will the proposed development impact on the socio-economic environment?”

There are some vulnerable communities within the project area that may be affected by the development Harmony Joel Solar Facility and its associated infrastructure. Traditionally, the construction phase of a PV solar development is associated with most social impacts. Many of the social impacts are unavoidable and will take place to some extent but can be managed through the careful planning and implementation of appropriate mitigation measures. Several potential positive and negative social impacts have been identified for the project, however an assessment of the

potential social impacts indicated that there are no perceived negative impacts that are sufficiently significant to allow them to be classified as “fatal flaws”.

- Based on the social impact assessment, the following general conclusions and findings can be made:
- The potential negative social impacts associated with the construction phase are typical of construction related projects and not just focussed on the construction of solar PV projects (these relate to an influx of non-local workforce and jobseekers, intrusion, and disturbance impacts (i.e., noise and dust, wear, and tear on roads) and safety and security risks) and could be reduced with the implementation of the mitigation measures proposed. The significance of such impacts on the local communities can therefore be mitigated.
- The site falls within existing mining development area and therefore falls within the mines social and economic processes and structures, things such as the socio-economic development and local economic development plans will take into consideration the development of the PV facilities.
- The development will introduce employment opportunities during the construction phase (temporary employment) and a limited number of permanent employment opportunities during operation phase.
- The proposed project could assist the local economy in creating entrepreneurial growth and opportunities, especially if local business is involved in the provision of general material, goods and services during the construction and operational phases. This positive impact is likely to be compounded by the cumulative impact associated with the development of several other solar facilities within the surrounding area, and because of the project’s location within an area which is characterised by high levels of solar irradiation, and which is therefore well suited to the development of commercial solar energy facilities.
- The proposed development also represents an investment in infrastructure for the generation of non-polluting, Renewable Energy, which, when compared to energy generated because of burning polluting fossil fuels, represents a positive social benefit for society.
- When considering Harmony Joel Solar, it is also important to consider the cumulative social impacts that may arise with other proposed solar PV projects in the area.
- It should be noted that the perceived benefits associated with the project, which include RE generation and local economic and social development, outweigh the perceived impacts associated with the project.

The proposed mitigation measures should be implemented to limit the negative impacts and enhance the positive impacts associated with the project.

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

5.3. Social Impacts Associated with the Construction Phase

The majority of social impacts associated with the project are anticipated to occur during the construction phase of the development and are typical of the type of social impacts generally associated with construction activities. These impacts will be temporary and short-term (~12 months) but could have long-term effects on the surrounding social environment if not planned or managed appropriately. It is therefore necessary that the detailed design phase be conducted in such a manner so as not to result in permanent social impacts associated with the ill-placement of project components or associated infrastructure or result in the mismanagement of the construction phase activities.

The positive and negative social impacts identified and assessed for the construction phase includes:

Potential positive impacts

- Creation of employment and business opportunities
- Contribution to the local economy
- Skills Development
- Growth of the local communities

Potential negative impacts

- Impacts associated with the presence of construction workers on site
- Threat to safety and security with the presence of construction workers on site
- Impact of heavy vehicles, including damage to roads, safety, noise, and dust

- Pressure to local services

Construction Phase

Nature:

Employment opportunities and skills development

Impact description: Harmony Gold currently have social labour plans in place which meet the requirements of employment in terms of local employment and skills development, act. As per their current SLP (**Please see appendix B for the latest SLP**) the Harmony Joel Mining Operations will provide employment for 2000 employees in mining, construction, management or other related activities.

As per the SLP, the Harmony Joel Human Resources Development (HRD) Strategy supports the company’s business strategy and objectives, as well as the South African legislative and regulatory framework that seeks to address the general skills shortage within the country, as well as ensuring equitable representation in the workplace.

Part of these strategies include:

- Adult Basic Education Training
- Portable Skills Training plans
- Trainee Programmes and Learnerships for Employees
- Management Development Programs
- Talent Pool Development
- Community Human Resource Development Programme
- Learnerships for the Community

It is the mine’s intention to incorporate the development of the Harmony Joel Solar PV facility under the same principles as followed in the SLP, all be it on a smaller scale, relative to the size of the development of a 18MW solar PV facility.

	Rating	Motivation	Significance
<i>Prior to Enhancement</i>			
Duration	Short-term (1)	The construction period will last for less than one year.	Low Positive (30)
Extent	Local – Regional (5)	The impact will occur at a local, regional and national level.	
Magnitude	Low (4)	The creation of employment opportunities will assist to an extent in alleviating unemployment levels within the area.	
Probability	Probable (3)	Construction of the project will result in the creation of a number of direct and indirect employment opportunities, which will assist in addressing unemployment levels within the area and aid in skills development of communities in the area.	

Enhancement measures:

To enhance the local employment, skills development and business opportunities associated with the construction phase, the following measures should be implemented:

- It is recommended that the development be incorporated under the mines SLP, and the skills development processes and policies currently being implemented at the mine or associated infrastructure be incorporated in the development and operation of the Solar energy facility.
- The strategies mentioned in the SLP (Adult Basic Education Training, Management Development Programs, Community Human Resource Development Programs, etc.) be specifically focused on mining and the renewable energy development sector.
- Be commitment to involving and benefiting the communities neighbouring the mines, contributing to their development and growth, therefore it is recommended that particular attention be given to the needs of the people living near the mine in the Free State Province
- It is recommended to conduct structured and proactive engagement sessions within the municipal district, to expose local small, micro and medium enterprises which will benefit from the proposed development
- In terms of the MPRDA, REGULATION 46 (b) (v) states that: “The contents of a Social and Labour Plan must include a human resources development programme which must include the employment equity statistics which must be completed in the form of “Form S” contained in Annexure II and the mines plan to achieve the 10 percent women participating in mining and 40 percent historically disadvantaged South Africans (HDSA) participation in management within 5 years from the granting of the right or the conversion of the old order right” – It is recommended that the development of a solar facility be undertaken with the same equity goals, giving consideration to woman and previously disadvantaged individuals during the recruitment process.
- Training and skills development programmes should be initiated prior to the commencement of the construction phase.

Post Enhancement

Duration	Short-term (1)	The construction period will last for less than one year.	Medium Positive (55)
Extent	Regional (4)	The impact will occur at a local, regional and national level.	
Magnitude	Moderate (6)	The creation of employment opportunities will assist to an extent in alleviating unemployment levels within the area.	
Probability	Definite (5)	Construction of the project will result in the creation of a number of direct and indirect employment opportunities, which will assist in addressing unemployment levels within the area and aid in the skills development of communities in the area.	

Residual Risks:

- Initiatives to eliminate unfair discrimination in employment.
- Recruit and select suitably qualified individuals from the designated groups.
- Advance employees from designated groups who have been identified in the talent pool and to fast track them through focused training and development programmes.
- Assist individuals to acquire an initial vocational education and pre-qualification, in addition to further education and training, and which refreshes knowledge, skills, work and life competencies that are crucial for overall development.
- Provide portable skills training to employees who show an interest in obtaining such training and with a special emphasis on employees who are incapacitated or retrenched in order to remain economically active, employable or self-sustaining within their communities.

- Growth of talent is facilitated, thereby providing opportunities for all employees to contribute to their full potential.

Nature:

Contributions to the local economy

Impact description: Harmony Gold Mine - Harmony Joel Operations states that they are committed to the sustainable socio-economic development and the well-being of the communities in which they operate by contributing to community development that is sustainable long after mining operations have ceased.

Harmony’s corporate social responsibility (CSR) policy for their South African operations recognises the need for socio-economic development in the country. This policy includes local economic development (LED) initiatives executed in terms of the Mining Charter, MPRDA regulations and codes of good practice for the minerals and mining industry.

	Rating	Motivation	Significance
<i>Prior to Enhancement</i>			
Duration	Long-term (4)	Will continue for the duration of the project due to legal obligation to pay taxes.	Medium Positive (36)
Extent	Local – Regional (4)	Will include mostly local and some regional impacts.	
Magnitude	Low (4)	Will derive from increased cash flow from wages, local procurement, economic growth, taxes and LED and HRD initiatives.	
Probability	Probable (3)	Will depend on; proportion of local spending by employees, capacity of local enterprises to supply; effectiveness of LED and HRD initiatives, contributions to local government.	

Enhancement measures:

It has to be noted that there currently are measures in place that speaks to economic development in terms of the mining operations:

- The Harmony tender policy was amended to give preference to BEE entity suppliers.
- BEE entities can win tenders even when their price is higher than that of non-BEE entity suppliers.
- Certain commodities are set aside and may only be purchased from BEE-entity suppliers and certain commodities may only be acquired from 100% black owned suppliers through the Harmony business development centers.
- BEE-entities get a second chance to revise their tender price, should they not win a tender.
- Preference is given to suppliers that are local to the operation where the service will be consumed.

The following measures must also be considered when constructing the solar PV facility:

- Establishing liaison and communication structures with the district and local government structures
- Liaises with the local governmental structures and municipal authorities in the labour- sending communities to ensure that group development initiatives are integrated into the economic and development plans of those areas.
- The continuous review of the economic development of the project during the implementation process will ensure that the project does not become static but are revised in terms of changing needs and to ensure sustainability.
- It is recommended that a local procurement policy be adopted by the developer to maximise the benefit to the local economy, where feasible.

- Through the development of the Solar Facility create employment opportunities, boost local economies through supporting business activities and contributing to the government tax revenues.
- The Developer of the Solar Facility should establish a database of local companies, specifically Historically Disadvantaged (HD) companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the procurement of construction contractors. These companies should be notified of the tender process and invited to bid for project-related work where applicable.
- Engage with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers, where feasible.

Post Enhancement

Duration	Long-term (4)	As for pre-enhancement	Medium Positive (60)
Extent	Local – Regional (4)	SMME capacity building will limit procurement from outside the local municipality.	
Magnitude	Low (4)	Mitigation will likely increase intensity of multiplier effects as it will concentrate impact to local area, sustainability of initiatives will also be increased if aligned with other those of other institutions.	
Probability	Definite (5)	Increased local employment and procurement as well as skilled SMME’s skill enhance likelihood of benefits to local economy.	

Residual Risks:

- Improved local service sector, growth in local business.
- Community development and stimulation of the local economy.
- Growth in the local markets.

Nature:

Safety and security

Impact description: Temporary increase in safety and security concerns associated with the influx of people during the construction phase.

The Solar PV Development will fall in line with the Harmony Joel’s occupational safety and health policies and related management frameworks which are aligned with the Mine Health and Safety Act in South Africa. A co-operative approach is undertaken, involving all stakeholders, ensuring that the necessary infrastructure and systems are in place – including relevant planning, communication and training.

	Rating	Motivation	Significance
<i>Prior to Mitigation</i>			
Duration	Short-term (2)	Will be limited to the construction phase which is less than one year.	Low Negative (27)
Extent	Local – Regional (3)	Safety concerns will affect nearby communities.	
Magnitude	Low (4)	Could place the lives of neighboring community members at risk.	
Probability	Probable (3)	Traffic would need to be considered in the area.	

Mitigation:

- Stopping significant unwanted events by focusing on critical control management.
- Safety awareness and training as well as positive behavior reinforcement.
- Improving system monitoring and analysis to improve risk management.
- Encourage employees to stop working when a workplace is considered unsafe and/or to prevent unsafe actions.
- Focus on critical control management (as per International Council on Mining and Metals guidelines).
- Education, Training and Development Services must be implemented.
- Access in and out of the construction area should be strictly controlled by a security company.
- The contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff.
- Have clear rules and regulations for access to the proposed site to control loitering.
- A comprehensive employee induction programme would cover land access protocols, fire management and road safety must be prepared.
- A Community Liaison Officer should be appointed.
- A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.

Post Mitigation

Duration	Short-term (2)	As for pre-mitigation	Low Negative (16)
Extent	Local (2)	Safety measures will likely restrict impacts on nearby communities.	
Magnitude	Low (4)	Appropriate mitigation will reduce the risk of this project.	
Probability	Improbable (2)	As for pre-mitigation.	

Residual Risks:

None anticipated.

Nature:

Disruption of daily living and movement patterns

Impact description: Temporary increase in traffic disruptions and movement patterns during the construction phase, Transport of equipment, material and staff to site will lead to congestion.

	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Short-term (2)	Will be limited to the construction phase which is less than one year.	Medium Negative (40)
Extent	Local (2)	Will affect road users from nearby communities.	
Magnitude	Moderate (6)	Will affect the quality of life of neighboring communities.	
Probability	Highly probable (4)	Traffic would need to be considered in the area.	

Mitigation:

- Implement standard dust control measures on gravel roads, including periodic spraying (frequency will depend on many factors including weather conditions, soil composition and traffic intensity and must thus be adapted on an on-going basis) of construction areas and access roads, and ensure that these are continuously monitored to ensure effective implementation.
- Stagger component delivery to site.
- Reduce the construction period.
- Make use of mobile batch plants and quarries in close proximity to the site.
- All vehicles must be road worthy, and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues.
- Heavy vehicles should be inspected regularly to ensure their road worthiness.
- Provision of adequate and strategically placed traffic warning signs, that have to be maintained for the duration of the construction phase, and control measures along the R30, R730 and various unnamed roads to warn road users of the construction activities taking place for the duration of the construction phase. Warning signs must be always visible, especially at night.
- Implement penalties for reckless driving to enforce compliance to traffic rules.
- Avoid heavy vehicle activity during “peak” hours (when children are taken to school, or people are driving to work).
- Ensure that all fencing along access roads is maintained in the present condition or repaired if disturbed due to construction activities.
- The Contractor must ensure that damage/wear and tear caused by construction related traffic to the access roads is repaired before the completion of the construction phase.
- Method of communication must be implemented whereby procedures to lodge complaints are set out for the local community to express any complaints or grievances with the construction process.

Post Mitigation

Duration	Short-term (2)	As for pre-mitigation	Low Negative (16)
Extent	Local (2)	Safety measures will likely restrict impacts on road users.	
Magnitude	Low (4)	Appropriate mitigation will reduce the risk of this project.	
Probability	Improbable (2)	As for pre-mitigation.	

Residual Risks:

None anticipated.

Nature:

Increased pressure on local services/resources

Impact description: Added pressure on economic and social infrastructure during construction as a result of in-migration of people.

	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Short-term (2)	Influx related pressure on services will start during construction and continue during the operational phase.	Medium Negative (30)
Extent	Local (2)	May affect resource management on local district municipal level.	
Magnitude	Moderate (6)	Intensify existing service delivery and resource problems and backlogs, especially sewerage and road networks.	

Probability	Probable (3)	Population influx will affect the ability of the local municipality to meet increased demand.	
Mitigation:			
<ul style="list-style-type: none"> A Community Liaison Officer should be appointed. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. Current procurement channels set up by the mine should be utilized to reduce any complications which may arise from the development. 			
Post Mitigation			
Duration	Short-term (2)	As for pre-mitigation.	Low Negative (16)
Extent	Local (2)	Safety measures will likely restrict impacts on road users.	
Magnitude	Low (4)	Appropriate mitigation will reduce the risk of this project.	
Probability	Improbable (2)	As for pre-mitigation.	
Residual Risks:			
<ul style="list-style-type: none"> Possibility of outside workers remaining in the area after construction is completed and subsequent pressures on local infrastructure. 			

Nature:			
Increased pressure on local services/resources			
Impact description: Added pressure on economic and social infrastructure during construction as a result of immigration of people.			
	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Short-term (2)	Influx related pressure on services will start during construction and continue during the operational phase.	Medium Negative (30)
Extent	Local (2)	May affect resource management on local district municipal level.	
Magnitude	Moderate (6)	Intensify existing service delivery and resource problems and backlogs, especially sewerage and road networks.	
Probability	Probable (3)	Population influx will affect the ability of the local municipality to meet increased demand.	
Mitigation:			
<ul style="list-style-type: none"> It is necessary to appoint a Community Liaison Officer. A method of communication should be implemented, with procedures for filing complaints outlined, so that the local community can express any complaints or grievances about the construction process. Current procurement channels set up by the mine should be utilized to reduce any complications which may arise from the development. 			
Post Mitigation			
Duration	Short-term (2)	As for pre-mitigation.	Low Negative (16)
Extent	Local (2)	Safety measures will likely restrict impacts on road users.	

Magnitude	Low (4)	Appropriate mitigation will reduce the risk of this project.	
Probability	Improbable (2)	As for pre-mitigation.	

Residual Risks:

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

Nature:

Nuisance impacts (noise& dust)

Impact description: Construction activities will result in the generation of noise and dust over a period of months. However, the development is located directly adjacent to mining sites. The noise and dust impact are therefore insignificant in comparison to the noise and dust generated by the mine and will only be temporary in nature.

	Rating	Motivation	Significance
<i>Prior to Mitigation</i>			
Duration	Short-term (2)	Nuisance impacts will only be limited to the construction phase.	Medium Negative (44)
Extent	Local (1)	This will remain within the project extent from construction activities.	
Magnitude	High (8)	Dust impacts and noise nuisance from construction activities.	
Probability	Highly Probable (4)	Movement of heavy construction vehicles during the construction phase has a potential to create noise, damage to roads and dust.	

Mitigation:

- The development of the Solar PV facility will be on owned and operated by the Harmony Joel mine, the employees of the mine are subjected to:
 - Annual audiometric testing at occupational health hubs during medical examinations.
 - Awareness drives to ensure employees are aware of the benefits of wearing personalized hearing protection.
 - Monitoring programs to measure actual compliance in the workplace.
 - Compliance monitoring is undertaken during routine occupational hygiene inspections and ad hoc audits are also conducted.
- It is furthermore predicted that the current dust levels generated by the mining activities in the area far exceed that which will be generated by the construction of the PV facility. The Harmony Joel mine currently has standardized dust control measures in place which will allow the monitoring of the dust generation by the PV facility, these include:
 - leading practices as advocated by the Mining Industry Occupational Safety and Health (MOSH).
 - Multi-stage dust filtration systems.
 - Training and awareness programmes address dust control in stopes and all development ends are equipped with water blasts to settle dust directly after a blast.

The following “Generic” Noise and Dust suppression must be implemented where not covered by current mining processes:

- During construction care should be taken to ensure that noise from construction vehicles and plant equipment does not intrude on the surrounding residential areas. Plant equipment such as generators, compressors, concrete mixers as well as vehicles should be kept in good operating order and where appropriate have effective exhaust mufflers.
- The movement of construction vehicles on the site should be confined to agreed access road/s.

- The movement of heavy vehicles associated with the construction phase should be timed (where possible) to avoid times days of the week, such as weekends, when the volume of traffic travelling along the access roads may be higher.
- Dust suppression measures should be implemented, such as wetting on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.

Post Mitigation

Duration	Short-term (2)	As for pre-mitigation	Low Negative (18)
Extent	Local (1)	Mitigation measures will assist with increasing the impact.	
Magnitude	Moderate (6)	Appropriate mitigation will reduce the risk of this project	
Probability	Improbable (2)	As for pre-mitigation	

Residual Risks:

- Noise and Dust generation will remain an issue irrespective of the Solar PV development.

5.4. Social Issues Associated with the Operation Phase

The operational phase is associated with the following key potential positive and negative social issues.

Potential positive impacts:

- Creation of employment and business opportunities.
- Social benefits associated with being a mining related development.
- If realized contributing to the tourism and recreational development of the area.
- Benefits associated with the additional funding available for socio-economic and/or enterprise development measures.
- Benefits associated with the establishment of a legal entity representing allocated beneficiary community (such as a community trust).
- Impact on tourism.
- The establishment of renewable energy infrastructure.

Potential negative impacts:

- The visual impacts and associated impact on sense of place.
- Potential impact on tourism.
- Influx of job seekers to the area.

Nature:

Job creation during operation

Impact description: Harmony Gold currently have social labour plans in place which meet the requirements of employment in terms of local employment and skills development, act. As per their current SLP (Please see appendix B for the latest SLP) the Harmony Joel Mining Operations will provide employment for 2000 employees in mining, construction, management or other related activities.

As per the SLP, the Harmony Joel Human Resources Development (HRD) Strategy supports the company’s business strategy and objectives, as well as the South African legislative and regulatory framework that seeks to address the general skills shortage within the country, as well as ensuring equitable representation in the workplace.

Part of these strategies include:

- Adult Basic Education Training
- Portable Skills Training plans
- Trainee Programmes and Learnerships for Employees
- Management Development Programs
- Talent Pool Development

- Community Human Resource Development Programme
- Learnerships for the Community

It is the mine's intention to incorporate the development of the Harmony Joel Solar PV facility under the same principles as followed in the SLP, all be it on a smaller scale, relative to the size of the development of a 30MW solar PV facility.

	Rating	Motivation	Significance
Prior to Enhancement			
Duration	Long term (4)	Project will be operational up to 30years	Medium Positive (33)
Extent	Regional (3)	Any new positions are likely to be filled by persons living in the local municipal area	
Magnitude	Low (4)	It is anticipated that ~10 jobs will be generated during the operation phase. A number of highly skilled personnel may need to be recruited from outside the local municipal area	
Probability	Probable (3)	Employment opportunities will be created during the operation phase	

Enhancement measures:

To enhance the local employment, skills development and business opportunities associated with the construction phase, the following measures should be implemented:

- It is recommended that the development be incorporated under the mines SLP and the skills development processes and policies currently being implemented at the mine or associated infrastructure be incorporated in the development and operation of the Solar energy facility.
- The strategies mentioned in the SLP (Adult Basic Education Training, Management Development Programs, Community Human Resource Development Programs, etc.) be specifically focused on mining and the renewable energy development sector.
- Be commitment to involving and benefiting the communities neighbouring the mines, contributing to their development and growth, therefore it is recommended that particular attention be given to the needs of the people living near the mine in the Free State Province.
- It is recommended to conduct structured and proactive engagement sessions within the municipal district, to expose local small, micro, and medium enterprises which will benefit from the proposed development.
- In terms of the MPRDA, REGULATION 46 (b) (v) states that: "The contents of a Social and Labour Plan must include a human resources development programme which must include the employment equity statistics which must be completed in the form of "Form S" contained in Annexure II and the mines plan to achieve the 10 percent women participating in mining and 40 percent historically disadvantaged South Africans (HDSA) participation in management within 5 years from the granting of the right or the conversion of the old order right" – It is recommended that the development of a solar facility be undertaken with the same equity goals, giving consideration to woman and previously disadvantaged individuals during the recruitment process.
- Training and skills development programmes should be initiated prior to the commencement of the construction phase.

Post Enhancement

Duration	Long-term (4)	As for pre-enhancement	Medium Positive (44)
Extent	Local - regional (3)	As for pre-enhancement	
Magnitude	Low (4)	Mitigation will maximise local job creation	
Probability	High Probable (4)	Mitigation will maximise probability that any local recruitment targets are achieved, and local benefits optimised	

Residual Risks:

Improved pool of skills and experience in the local area

- Recruit and select suitably qualified individuals from the designated groups.
- Advance employees from designated groups who have been identified in the talent pool and to fast track them through focused training and development programmes.
- Assist individual to acquire an initial vocational education and pre-qualification, in addition to further education and training, and which refreshes knowledge, skills, work and life competencies that are crucial for overall development.
- Provide portable skills training to employees who show an interest in obtaining such training and with a special emphasis on employees who are incapacitated or retrenched in order to remain economically active, employable, or self-sustaining within their communities.

Nature:

Development of solar PV facility under existing mining guidelines and policies

Impact description: Mines are long standing institutions that in theory should have the capital, resources, and means to ensure that positive social benefits are realized, through the utilization of their existing policies and procedures, furthermore, developing on mine owned property results in the better utilization of the environment in a less 'evasive' and harmful way. Resulting in an overall positive social gain.

	Rating	Motivation	Significance
Prior to Enhancement			
Duration	Long term (4)	For the duration of both the life of mine and the life of the PV facility.	Medium Positive (48)
Extent	Local – Regional - National (4)	Local, as it will mostly benefit the mining communities which survive from the mining developments in the area.	
Magnitude	Low (4)	Low, for the scale of the project.	
Probability	Highly Probable (4)	Facility will help contribute to the total social development.	

Enhancement measures:

- The use of existing policies and procedures be implemented.

Post Enhancement

Duration	Long term (4)	As for pre-enhancement.	Medium Positive (48)
Extent	National (4)	As for pre-enhancement.	
Magnitude	Low (4)	As for pre-enhancement.	
Probability	Highly Probable (4)	As for pre-enhancement.	

Residual Risks:

None anticipated.

Nature:

Development of clean, renewable energy infrastructure

Impact description: Development of clean, renewable energy infrastructure.

The primary goal of the proposed project is to improve energy security in South Africa by generating additional energy. The proposed Solar PV Facility also reduces the carbon footprint associated with energy generation. The project should therefore be viewed within the context of the South Africa's current reliance on coal powered energy to meet the majority of its energy needs.

	Rating	Motivation	Significance
Prior to Enhancement			

Duration	Long term (4)	Adding a renewable energy sector to the Fezile Dabi District economy may contribute to the diversification of the local economy and provide greater economic stability.	Medium Positive (48)
Extent	Local – Regional - National (4)	The generation of renewable energy will contribute to South Africa’s electricity market. The mine will be the private off-taker of the power generated by the facility the proposed development will indirectly relieve the national grid.	
Magnitude	Low (4)	The proposed facility will only generate up to 30MW.	
Probability	Highly Probable (4)	Facility will help contribute to the total carbon emissions associated with non-renewable energy generation.	
Enhancement measures: None anticipated			
Post Enhancement			
Duration	Long term (4)	As for pre-enhancement.	Medium Positive (48)
Extent	National (4)	As for pre-enhancement.	
Magnitude	Low (4)	As for pre-enhancement.	
Probability	Highly Probable (4)	As for pre-enhancement.	
Residual Risks:			
<ul style="list-style-type: none"> Reduce carbon emissions through the use of renewable energy and contribute to reducing global warming. The renewable energy infrastructure places this project at the heart of the national strategy to increase power supply as well as reduce power generation impacts on climate. The PV facility’s location also uniquely connects the local community to skills for this sector, thus improving their employability. 			

Nature:			
Visual impacts and impacts on sense of place			
Impact description: Visual impacts and sense of place impacts associated with the operation phase of the project.			
Due to the number of mines in the area, the scenic quality of the region is low, further construction and operation of the Solar PV Facility in the area is likely to have a negative impact.			
	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Long term (4)	Impact on sense of place relates to the change in the landscape character and visual impact of the proposed solar energy facility.	Low Negative (18)
Extent	Local (1)	Dependent on the demographics of the population that resides in the area and their perceptions.	
Magnitude	Low (4)	There are industrial/mining operations and formal residential areas located in proximity to the site.	

Probability	Improbable (2)	There are no tourist attractions located adjacent to the property and therefore the anticipated impact on the area’s visual quality and sense of place is low.	
Mitigation: None anticipated			
Post Mitigation			
Duration	N.A. – Mitigation not possible.		N.A. – Mitigation not possible.
Extent	N.A. – Mitigation not possible.		
Magnitude	N.A. – Mitigation not possible.		
Probability	N.A. – Mitigation not possible.		
Residual Risks:			
<ul style="list-style-type: none"> None anticipated if the visual impact will be removed after decommissioning, provided the solar energy facility infrastructure is removed and the site is rehabilitated to its original (current) status 			

5.5. Social Issues Associated with the Decommissioning Phase

The social impact of decommissioning the Harmony Joel PV project is likely to be significant. While the relatively small number of people employed during the operational phase (15), the associated funding available for community projects and benefits are significant and expected to end with decommissioning of the facility. With mitigation however, the impacts are assessed to be low.

The proponent should inform and discuss the stakeholder and wider community involved and affected in the governance, management and implementation of community funds about the decommissioning of the energy project. This communication needs to be timed well in advance of the decommissioning, allowing all relevant parties to prepare. Further consideration is required to develop strategies for rehabilitation of the land.

5.6. Social Issues Associated with the No-Development Option

The “no-go” alternative is the option of not constructing the Harmony Joel Solar PV. The implementation of the proposed project is expected to result in a number of positive and negative social impacts. The majority of negative impacts identified for the project are associated with the construction phase of the project, while the positive impacts are associated with both the construction and operation phases of the project.

Potential negative social impacts associated with the construction and operation of the project include the following:

- Potential influx of job seekers and an associated change in population and increase in pressure on basic services.
- Potential safety and security impacts.
- Potential impacts on daily living and movement patterns.
- Potential nuisance impacts (noise and dust).
- Potential visual impact and impact on the sense of place.

Potential positive social impacts associated with the construction and operation of the project include the following:

- Potential direct and indirect employment opportunities.
- Skills development and training
- Development of Renewable energy facilities
- Potential economic multiplier effect.

The impacts of pursuing the “no-go” alternative can therefore be summarised as follows:

- The benefits would be that there is no disruption from nuisance impacts (noise and dust during

- construction), visual impacts and safety and security impacts. The impact is therefore neutral.
- There would also be an opportunity loss in terms of limited job creation, skills development, community upliftment and associated economic business opportunities for the local economy. This impact is considered to be negative.
- The opportunity to strengthen the grid connection within the municipal area would be lost which will have a negative impact on economic growth and development and therefore result in negative social impacts.

The No-Development option would mean that the electricity generated through renewable sources, in this case solar energy, is not generated and fed into the national electricity grid. In the given and described policy context, this would represent a negative social and environmental cost.

In addition, the employment opportunities associated with the construction and operational phase, as well as the benefits associated with the additional funding for socio-economic and enterprise development measures and the established local ownership entity representing beneficiary communities would be forgone.

5.7. Social Issues Associated with the Cumulative Impact on Sense of Place

The potential cumulative impacts on the areas sense of place will be largely linked to potential visual impacts. In this regard the Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts associated with wind farms on landscapes. These issues are also likely to be relevant to solar facilities and associated infrastructure. The relevant issues identified by Scottish Natural Heritage study include:

- Combined visibility (whether two or more wind farms will be visible from one location).
- Sequential visibility (e.g. the effect of seeing two or more wind farms along a single journey, e.g. road or walking trail).
- The visual compatibility of different wind farms in the same vicinity.
- Perceived or actual change in land use across a character type or region.
- Loss of a characteristic element (e.g. viewing type or feature) across a character type caused by developments across that character type.

The guidelines also note that cumulative impacts need to be considered in relation to dynamic as well as static viewpoints. The experience of driving along a tourist road, for example, needs to be considered as a dynamic sequence of views and visual impacts, not just as the cumulative impact of several developments on one location. The viewer may only see one renewable energy facility and the associated infrastructure at a time, but if each successive stretch of the road is dominated by views of renewable energy facilities, then that can be argued to be a cumulative visual impact (National Wind Farm Development Guidelines, DRAFT - July 2010).

As indicated above, the potential impact of the proposed REF and associated infrastructure on the areas sense of place is likely to be negligible. The cumulative impacts are also likely to be very low. This will be confirmed during the assessment phase.

The establishment of the facility will be a game-changing event for the community and local municipality. It'll result in the following impacts, in varying degrees:

- People
 - Skills development
 - Employment
 - Renewed sense of hope
 - Improved social outcomes owing to SED investments:
 - Health
 - Education
 - Economic participation
 - Social cohesion for the community beneficiaries
 - Increased sense of prestige for the community and town

- Planet
 - Increased power supply for the country, with less damage to the planet as a consequence.
- Profit
 - Increased revenue for local municipality
 - Increased economic activity in local community and broader municipality
 - Investment in social and commercial infrastructure to increase economic activity.

Cumulative impacts have been considered as part of this energy facility has the potential to result in significant positive cumulative impacts; specifically with the establishment of a number of Solar energy facilities in the vicinity of the Local Municipality will create a number of socio-economic opportunities for the area, which in turn, will result in a positive social benefit. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. Benefits to the local, regional and national economy through employment and procurement of services could be substantial should many renewable energy facilities proceed. This benefit will increase significantly should critical mass be reached that allows local companies to develop the necessary skills to support construction and maintenance activities and that allows for components of the renewable energy facilities to be manufactured in South Africa. Furthermore at municipal level, the cumulative impact could be positive and could incentivize operation and maintenance companies to centralize and expand their activities towards education and training.

<i>Nature:</i> An increase in employment opportunities, skills development and business opportunities with the establishment of a solar energy facility		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
<i>Extent</i>	Local -regional (3)	Local-regional (3)
<i>Duration</i>	Long-term (4)	Long-term (4)
<i>Magnitude</i>	Low (4)	Moderate (6)
<i>Probability</i>	Probable (3)	Probable (3)
<i>Significance</i>	Medium (33)	Medium (52)
<i>Status (positive or negative)</i>	Positive	Positive
<i>Reversibility</i>	N/A	N/A
<i>Irreplaceable loss of resources?</i>	N/A	N/A
<i>Can impacts be mitigated?</i>	Yes	Yes
<i>Confidence in findings:</i> High.		
<i>Mitigation:</i> The establishment of a number of solar energy facilities in the area does have the potential to have a positive cumulative impact on the area in the form of employment opportunities, skills development and business opportunities. The positive benefits will be enhanced if local employment policies are adopted, and local services providers are utilised by the developers to maximise the project opportunities available to the local community.		

<i>Nature:</i> Negative impacts and change to the local economy with an in-migration of labourers, businesses and jobseekers to the area		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
<i>Extent</i>	Local (1)	Local-regional (3)
<i>Duration</i>	Long-term (4)	Long-term (4)
<i>Magnitude</i>	Minor (2)	Low (4)
<i>Probability</i>	Very improbable (1)	Improbable (2)
<i>Significance</i>	Low (7)	Low (22)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Yes	
<i>Irreplaceable loss of resources?</i>	No	
<i>Can impacts be mitigated?</i>	Yes	

Confidence in findings: High.

Mitigation:

- » Develop a recruitment policy/process (to be implemented by contractors), which will ensure the sourcing of labour locally, where available.
- » Work together with government agencies to ensure that service provision is in line with the development needs of the local area.
- » Form joint ventures with community organisations, through Trusts, which can provide local communities with benefits, such as employment opportunities and services.
- » Develop and implement a recruitment protocol in consultation with the municipality and local community leaders. Ensure that the procedures for applications for employment are clearly communicated.

6. CONCLUSIONS AND IMPACT STATEMENT

6.1. Conclusions and Recommendations

The project represents an important development opportunity for the communities surrounding Harmony Joel PV. Should it be approved, it will not only supply the mine with much needed clean power, but will also achieve the following for social upliftment:

- Increase educational attainment of local youth through a bursary programme funded through SED.
- Improved renewable energy presence in the country
- Elevation of the national energy crisis
- Increase the number of job-creating enterprises funded through ED.
- Improve key infrastructure identified by the community such as housing and roads.
- Increase the skills levels of local community.
- Lead to lasting economic development gains for the local community and province.

The development of the Solar PV Facility will ensure that (if in line with the Harmony Joel Mining Operation) skills development and employment equity strategies are aimed at achieving a demographically representative workforce. It is recommended that the Harmony Joel Solar PV Facility is guided by the provisions of the Skills Development and Employment Equity Acts in terms of both planning and reporting, including with respect to “Core and Critical skills” whilst intensive attempts are made to improve all core and critical skills occupations which is still lagging due to the skills challenges faced by the industry in this respect.

As per the mines Social labour plan, the Human Resources Development interventions aims to address the abovementioned challenges through a variety of initiatives such as

- (i) Management Trainee Programmes,
- (ii) Bursary Schemes,
- (iii) Trainee Programmes, and
- (iv) Learnerships

The Developer should be committed to the sustainable socio-economic development and well-being of the communities in which they operate and from which they draw their employees. Both solar PV facilities and mining operations have a limited lifespan, therefore strategic objective should focus on contributing to community development that is sustainable long after such operations have ceased.

The No Development option does not have any impact. However, given the developmental agenda of both the country and the local area, failure to develop is to deny improvements in the wellbeing of households and the growth of the economy. The No Development option is particularly undesirable because the project’s potentially negative impacts are largely small and are all manageable. Therefore, because the project’s positive impacts heavily outweigh the negative impacts, it is recommended that it be permitted.

This SIA has focused on the collection of primary data to identify and assess social issues and potential social impacts. Secondary data was collected and presented in a literature review and primary data was collected through the public participation process and telephonic consultation with key stakeholders. The environmental assessment framework for assessment of impacts and the relevant criteria were applied to evaluate the significance of the potential impacts.

A summary of the potential positive and negative impacts identified for the detailed design, construction and operation phases are presented in Table 6 and 7 for the potential impacts identified.

Table 6: Summary of potential social impacts identified for the detailed design and construction phase

Impact	Significance without mitigation/enhancement	Significance with mitigation/enhancement
Positive Impacts		
Direct employment and skills development	Low	Medium
Economic multiplier effects	Low	Medium
Negative Impacts		
Safety and security risks	Low	Low
Impacts on daily living and movement patterns	Medium	Low
Nuisance impact (noise and dust)	Negative	Low

Table 7: Summary of potential social impacts identified for the operation phase

Impact	Significance without mitigation/enhancement	Significance with mitigation/enhancement
Positive Impacts		
Direct employment and skills development	Low	Medium
Development of clean, renewable energy infrastructure	Medium	Medium
Negative Impacts		
Visual and sense of place impacts	Low	Low
Impacts associated with the loss of agricultural land.	Medium	Medium

6.2. Key findings

Key Findings

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

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

Recommendations

The following recommendations are made based on the Social Impact Assessment and a thorough review of the concerns and suggestions raised by stakeholders and interested and affected parties during the stakeholder

engagement process. The proposed mitigation measures should be implemented to limit the negative impacts and enhance the positive impacts. Based on the social assessment, the following recommendations are made:

- In terms of employment related impacts, it is important to consider that job opportunities for the unskilled and semi-skilled are scarce commodities in the study area and could create competition among the local unemployed. Introducing an outside workforce will therefore most likely worsen local endeavours to obtain jobs and provoke discontent as well as put pressure on the local services available. Local labour should be utilised to enhance the positive impact of employment creation in the area. Local businesses should be involved with the construction activities where possible. It is imperative that local labour be sourced to ensure that benefits accrue to the local communities. Preference should thus be given to the use of local labour during the construction and operational phases of the project as far as possible.
- Locals should also be allowed an opportunity to be included in a list of possible local suppliers and service providers, enhancing the multiplier effect. This aspect would serve to mitigate other subsequent negative impacts such as those associated with the inflow of outsiders to the area, the increased pressure on the infrastructure and services in the area, as well as the safety and security concerns.
- Impacts associated with the construction period should be carefully mitigated to minimise any dust and noise pollution.
- Safety and security concerns should be considered during the planning and construction phases of the proposed project.

6.3. Conclusion

A site visit was undertaken during the Assessment Phase of the SIA. The site visit includes primary interviews with key stakeholders and interested and affected parties, interviews are semi-structured. Essentially the approach is to provide information on the proposed development to the stakeholders (including maps and diagrams showing location and what is planned etc.) and discuss the key activities that will take place, during the construction and operational phases.

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

7. REFERENCES AND SOURCES

- National Energy Act (No. 34 of 2008)
- National White Paper on Renewable Energy (2003)
- National Integrated Resource Plan for Electricity (2010, 2013 draft)
- National Development Plan (2013)
- Republic of South Africa, Department Government Communication, and Information System. South Africa Yearbook 2014/15
- Department of Energy, State of Renewable Energy in South Africa, 2015
- Free State Provincial Spatial Development Framework, Phase 3/3rd Draft Report (2013)
- Housing Development Agency, Free State: Informal settlements Status (2013)
- Free State Overview of Provincial Revenue and Expenditure 2012/13 (2013) Relevant policy and planning documents on district level include:
- Xhariep Integrated Development Plan 2012-2017
- Ka Seme District Municipality Integrated Development Plan 2015/16
- Renosterberg Local Municipality Integrated Development Plan 2014/15 (draft)
- Letsemeng Local Municipality Integrated Development Plan 2014/15
- Kopanong Local Municipality Integrated Development Plan 2014/15

WEBSITES

- <http://northerncapepsdf.co.za/>
- <http://greencape.co.za/>
- <http://www.fdc.co.za/about-the-free-state/energy>

FURTHER SOURCES

- <http://greencape.co.za/assets/Uploads/GreenCape-MIR-Renewable-Energy.pdf>
- <http://www.infrastructurene.ws/2014/08/07/new-renewable-energy-centre-of-excellence-launched/>

8. Appendix A: SIA ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPRr)

Construction Phase:

Direct employment and skills development

OBJECTIVE: Maximise local employment and skills opportunities associated with the construction phase			
Project component/s	Construction of the proposed Harmony Joel solar PV facility and associated infrastructure		
Potential Impact	The opportunities and benefits associated with the creation of local employment and skills development to be maximised.		
Activity/risksource	<ul style="list-style-type: none"> » Construction procurement practice employed by the Contractor » Developers' investment plan 		
Mitigation Target/Objective	The developer should aim to employ as many low-skilled and semi-skilled workers from the local area as possible. This should also be made a requirement for all contractors.		
Enhancement: Action/control	Responsibility	Timeframe	
Employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria	The Proponent & EPC Contractors	Pre-construction & construction phase	
Adopt a local employment policy to maximise the opportunities made available to the local labour force as far as possible (preference to Local Municipality)	The Proponent & EPC Contractors	Pre-construction & construction phase	
In the recruitment selection process; consideration must be given to women during recruitment process	EPC Contractors	Pre-construction & construction phase	
Set realistic local recruitment targets for the construction phase (preference to Local Municipality)	The Proponent & EPC Contractors	Pre-construction & construction phase	
Training and skills development programmes to be initiated prior to the commencement of the construction phase	The Proponent	Pre-construction & construction phase	
Performance Indicator	<ul style="list-style-type: none"> » Employment and business policy document that sets out local employment and targets completed before construction phase commences. » Employ as many semi and unskilled labour from the local area or local municipality as possible » Training and skills development programme undertaken prior to the commencement of construction phase. 		
Monitoring	<ul style="list-style-type: none"> » The developer and EPC contractor must keep a record of local recruitments and information on local labour to be shared with the ECO for reporting purposes. 		

Safety and security impacts

OBJECTIVE: To avoid or reduce the possibility of the increase in crime and safety and security issues during the construction phase			
Project component/s	Construction of the proposed Harmony Joel Solar PV facility and associated infrastructure		
Potential Impact	Increase in crime due to influx of non-local workforce and job seekers into the area		
Activity/risksource	Safety and security risks associated with construction activities		
Mitigation Target/Objective	To avoid or minimize the potential impact on local communities and their livelihoods		
Enhancement: Action/control	Responsibility	Timeframe	

Access in and out of the construction camp should be strictly controlled by a security company	EPC Contractor	Construction phase
The appointed EPC contractor must appoint a security company and appropriate security procedures are to be implemented	EPC Contractor	Construction phase
Open fires on the site for heating, smoking or cooking are not allowed, except in designated areas.	EPC Contractor	Construction phase
Contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff.	EPC Contractor	Pre-construction & construction phase
A comprehensive employee induction programme to be developed and utilised to cover land access protocols, fire management and road safety	EPC Contractor	Pre-construction & construction phase
Method of communication should be implemented whereby local landowners can express any complaints or grievances with construction process	EPC Contractor	Pre-construction & construction phase
Performance Indicator	<ul style="list-style-type: none"> » Employee induction programme, covering land access protocols, fire management and road safety » The construction site is appropriately secured with a controlled access system » Security company appointed and security procedures implemented 	
Monitoring	» The developer and EPC contractor must monitor the indicators listed above to ensure that they have been met for the construction phase	

Impacts on daily living and movement patterns

OBJECTIVE: To avoid or reduce traffic disruptions and movement patterns of local community during the construction phase		
Project component/s	Construction of the proposed Harmony Joel Solar PV facility and associated infrastructure	
Potential Impact	Increase in traffic disruptions, safety hazards, and impacts on movement patterns of local community as well as impact on private property due to the upgrade of the existing road and heavy vehicle traffic in the local area	
Activity/risk source	Construction activities affecting daily living and movement patterns	
Mitigation Target/Objective	To avoid or minimise the potential impact on local communities and their livelihoods	
Enhancement: Action/control	Responsibility	Timeframe
All vehicles must be road worthy, and drivers must be qualified, obey traffic rules, follow speed limits and made aware of the potential road safety issues	EPC Contractor	Construction phase
Heavy vehicles should be inspected regularly to ensure their road safety worthiness.	EPC Contractor	Construction phase
Implement penalties for reckless driving for the drivers of heavy vehicles as a way to enforce compliance to traffic rules.	EPC Contractor	Construction phase
Any damage/wear and tear caused by construction related traffic to the roads is repaired	The Proponent & EPC contractor	Construction phase
Provide adequate and strategically placed traffic warning signs and control measures along the R38 and secondary roads to warn road users of the construction activities taking place, displaying road safety messages and speed limits for the duration of the construction phase. Traffic warning signs must also be well illuminated at night.	EPC Contractor	Pre-construction & construction phase
A comprehensive employee induction programme to cover land access protocols and road safety. This must be addressed in the	EPC Contractor	Construction phase

Appoint a Community Liaison Officer and create method of communication whereby local community member can express any complaints or grievances	EPC Contractor	Pre-construction & construction phase
Performance Indicator	<ul style="list-style-type: none"> » Vehicles are roadworthy, inspected regularly and speed limits are adhered to » Traffic warning signs along R38 and secondary roads, also illuminated at night appointed and security procedures implemented 	
Monitoring	» The developer and EPC contractor must monitor the indicators listed above to ensure that they have been met for the construction phase	

Pressure on economic and social infrastructure impacts from an in migration of people

OBJECTIVE: Reduce the pressure on economic and social infrastructure and social conflicts from an influx of a non-local workforce and jobseekers during the construction phase		
Project component/s	Construction of the proposed Harmony Joel Solar PV facility and associated infrastructure	
Potential Impact	Increase in traffic disruptions, safety hazards, and impacts on movement patterns of local community as well as impact on private property due to the upgrade of the existing road and heavy vehicle traffic in the local area	
Activity/risk source	Construction activities affecting daily living and movement patterns	
Mitigation Target/Objective	To avoid or minimise the potential impact on local communities and their livelihoods	
Enhancement: Action/control	Responsibility	Timeframe
Where possible, make it a requirement for contractors to implement a 'locals first' policy. Should be advertised for construction employment opportunities, especially for semi and low-skilled job categories (preference to the local Municipality). Enhance employment opportunities for the immediate local area, if this is not possible, then the broader focus areas should be considered for sourcing workers such as the Local Municipality	The proponent & EPC Contractor	Pre- construction phase & construction phase
Prior to construction commencing representatives from the local community e.g. ward councillor, surrounding landowners should be informed of details of the construction schedule and exact size of the workforce.	EPC Contractor	Construction phase
Recruitment of temporary workers at the gates of the development should not be allowed. A recruitment office located in town with a Community Liaison officer should be established to deal with jobseekers.	EPC Contractor	Construction phase
Have clear rules and regulations for access to the proposed site to control loitering.	The Proponent & EPC contractor	Construction phase
A Community Liaison Officer should be appointed. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process	EPC Contractor	Pre-construction & construction phase
Performance Indicator	» Percentage of the workers employed in construction that come from local communities	
Monitoring	» The developer must keep a record of local recruitments and information on local labour to be shared with the ECO for reporting purposes	

Nuisance impacts (Noise & Dust)

OBJECTIVE: To avoid or minimise the potential impacts of noise and dust from construction activities during the construction phase		
Project component/s	Construction of the proposed Harmony Joel Solar PV facility and associated infrastructure	
Potential Impact	Heavy vehicles and construction activities can generate noise and dust impacts.	
Activity/risksource	Construction activities	
Mitigation Target/Objective	To avoid and or minimise the potential noise and dust impacts associated with construction activities	
Enhancement: Action/control	Responsibility	Timeframe
Implement dust suppression measures for heavy vehicles such as wetting the roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers	EPC Contractor	Construction phase
Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues	EPC Contractor	Construction phase
Ensure that drivers adhere to speed limits	EPC Contractor	Construction phase
A Community Liaison Officer should be appointed. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process	The Proponent & EPC contractor	Pre-construction & construction phase
Performance Indicator	<ul style="list-style-type: none"> » Dust suppression measures implemented for all heavy vehicles that require such measures during the construction phase » Enforcement of strict speeding limits » Road worthy certificates in place for all vehicles » Community liaison officer available for community grievances and communication channel 	
Monitoring	<ul style="list-style-type: none"> » The EPC contractor must monitor the indicators to ensure that they have been met for the construction phase 	

Operational Phase:

Direct employment and skills development during operation phase

OBJECTIVE: Maximise local employment and skills opportunities associated with the construction phase		
Project component/s	Operation and maintenance of the proposed Harmony Joel Solar PV facility and associated infrastructure	
Potential Impact	Loss of opportunities to stimulate production and employment of the local economy	
Activity/risksource	Labour practices employed during operations	
Enhancement: Target/Objective	Maximise local community employment benefits in the local economy	
Enhancement: Action/control	Responsibility	Timeframe
Adopt a local employment policy to maximise the opportunities made available to the local labour force. (preference to Local Municipality)	The Proponent & EPC Contractors	Operation phase
The recruitment selection process should seek to promote gender equality and the employment of women wherever possible	The Proponent & EPC Contractors	Operation phase

Establish vocational training programs for the local labour force to promote the development of skills	The Proponent & EPC Contractors	Operation phase
Performance Indicator	<ul style="list-style-type: none"> » Percentage of workers that were employed from local communities (Local Municipality) » Number of people attending vocational training throughout the operation phase 	
Monitoring	<ul style="list-style-type: none"> » The developer must keep a record of local recruitments and information on local labour to be shared with the ECO for reporting purposes 	

Visual and 'sense of place' impacts

OBJECTIVE: Reduce the visual and sense of place impacts associated with the operation phase of the project		
Project component/s	Operation and maintenance of the Proposed Harmony Joel solar PV facility and associated infrastructure	
Potential Impact	Change in the sense of place that also leads to the negative impact on the area and visual intrusions	
Activity/risksource	The PV facility and associated infrastructure	
Enhancement: Target/Objective	Reduce the visual disturbances to minimise the losses of the sense of place	
Enhancement: Action/control	Responsibility	Timeframe
<ul style="list-style-type: none"> » Vegetation screening to be placed between the site and adjacent properties if required. 	The Proponent	Operation phase
Performance Indicator	<ul style="list-style-type: none"> » Vegetation screening if required/necessary 	
Monitoring	<ul style="list-style-type: none"> » The developer must monitor the indicators if vegetation screening is required by adjacent landowners 	