

PROPOSED QUANTUM 1 SOLAR ENERGY FACILITY

Gauteng Province, South Africa

Social Impact Assessment Report

August 2023

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REPORT DETAILS

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Client	:	South Africa Mainstream Renewable Power Developments (Pty) Ltd
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SPECIALIST DECLARATION OF INTEREST

I, Cornelius Holtzhausen, declare that –

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

Cornelius Holtzhausen

Name



Signature

August 2023

Date

EXECUTIVE SUMMARY

1. Background

South Africa Mainstream Renewable Power Developments (Pty) Ltd is proposing the construction and operation of a Solar photovoltaic (PV) Energy Facility (SEF) and associated infrastructure on Portion 285 of the Farm Vlakplaats (a portion of portion 19) 160 near Krugersdorp in the Gauteng Province. Grid connection infrastructure to connect the 10MW Solar PV Energy Facility to the existing Eskom Tarlton Substation will comprise an 11kV overhead power line and an 11kV on-site substation. The power line will be assessed within a 300m wide and 0.1- 0.12km long grid corridor.

2. Identified impacts and mitigation measures

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 (~9 - 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 and planning 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 mis-management of the construction phase activities. The positive and negative social impacts identified and assessed for the construction phase include:

- » Direct employment opportunities
- » Economic multiplier effects
- » Influx of jobseekers and change in population
- » Safety and security impacts
- » Nuisance impacts, including noise and dust
- » Visual impacts and impacts on the sense of place

Operation phase

It is anticipated that the Quantum 1 Solar Energy Facility will operate for up to 25 years (which is equivalent to the operational lifespan of the project). The majority of positive outcomes are associated with the operational phase of the project. If managed appropriately, the positive impact can be effectively enhanced, and the negative impacts mitigated.

The potential positive and negative social impacts that could arise as a result of the operation of the proposed project include the following:

- » Direct employment and skills development opportunities
- » Development of clean, renewable energy infrastructure
- » Visual impact and impact on sense of place

Cumulative impacts

Cumulative impacts have been considered as this energy facility has the potential to result in significant positive cumulative impacts; specifically, since 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 a 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 the 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.

No-development option

Should the project not continue, the negative impacts associated with the project's construction and operation phases will not occur and the status quo will continue. The area will likely remain undeveloped, and the visual impacts associated with the grid infrastructure connecting the hydro plant to the national grid will not occur. Further, the potential safety and security issues associated with projects and developments of this magnitude will not occur, the same for the influx of job seekers to the area.

The region and country will however likewise not benefit from the construction of the project. While the project is not attempting the repair or otherwise prevent some environmental or social ill, the use of green renewable energy will serve to provide alternative clean energy in the face of the realities of climate change. The project will also serve to stabilise and bolster the struggling power supply in South Africa, which has done untold damage to the economy and society of the region and country.

Conclusions and Recommendations

The proposed Quantum 1 Solar Energy Facility and associated infrastructure is unlikely to result in permanent damaging social impacts. The Quantum 1 Solar Energy Facility has the potential to result in significant positive cumulative impacts, specifically with regards to the creation of several socio-economic opportunities for the region, which in turn, can result in positive social benefits. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. The cumulative benefits to the local and regional economy through employment and procurement of services are more considerable than that of the Quantum 1 Solar Energy Facility alone. From a social perspective, it is concluded that the project is acceptable and should be developed subject to the implementation of the recommended mitigation measures and management actions contained in this report.

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ACRONYMS

BA	Basic Assessment
DOE	Department of Energy
DM	District Municipality
EMPr	Environmental Management Programme
EPC	Engineering, Procurement and Construction
GVA	Gross Value Add
HD	Historically Disadvantage
HRD	Human Resource Development
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
IFC	International Finance Corporation
km	Kilometre
kV	Kilovolt
LED	Local Economic Development
LM	Local Municipality
NEMA	National Environmental Management Act (No. 107 of 1998)
NDP	National Development Plan
PV	Photovoltaic
RE	Renewable Energy
SDF	Spatial Development Framework
SEF	Solar Energy Facility
SIA	Social Impact Assessment
SMME	Small and Medium-Sized Enterprises

1. INTRODUCTION AND PROJECT DESCRIPTION

South Africa Mainstream Renewable Power Developments (Pty) Ltd (hereafter referred to as “Mainstream”) is proposing the construction and operation of a solar photovoltaic (PV) facility and associated infrastructure on Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160 near Krugersdorp in the Gauteng Province, to be known as Quantum 1 Solar Energy Facility. Grid connection infrastructure to connect the 10MW Solar PV Energy Facility to the existing Eskom Tarlton Substation will comprise an 11kV overhead power line and an 11kV on-site substation. The power line is located on the same property as the PV facility and will be assessed within a 300m wide and 0.1-0.12km long grid corridor.

1.1. Project Overview

A preferred development footprint with an extent of 19.148 ha and development area of ~94.1479 ha, has been identified by Mainstream as technically suitable for the development of the Quantum 1 Solar Energy Facility (**Figure 1-1**). The facility will comprise the following main infrastructure:

- » Solar PV array comprising solar modules.
- » Mounting System Technology.
- » Inverters and transformers.
- » Low voltage cabling between the PV modules to the inverters.
- » Overhead power line.
- » Onsite substation, switching substation and laydown areas. Battery Energy Storage System (BESS) and associated infrastructure.
- » Internal access roads.
- » Fence around the project development areas.
- » Maintenance facilities

The Quantum 1 Solar Energy Facility is proposed in response to the identified objectives of the national and provincial government and local and district municipalities to develop renewable energy facilities for power generation purposes. It is the developer's intention to submit a bid in terms of a regulated power purchase procurement process (e.g., REIPPPP) with the aim of evacuating the generated power into the national grid or obtaining a commercial PPA (Power Purchase Agreement). This will aid in the diversification and stabilisation of the country's electricity supply, in line with the objectives of the Integrated Resource Plan (IRP) with the Quantum 1 Solar Energy Facility set to inject up to 10MW (peak AC power) into the national grid.

From a regional perspective, the area within the West Rand District Municipality identified for the project is considered favourable for the development of a commercial PV facility due to the low environmental sensitivity of the identified site, excellent solar resource, and availability of land on which the development can take place. There is also potential for evacuating the power to the national grid via a direct grid connection at the Eskom Tarlton 132/44/11kV substation which is located within the proposed site. The development area is also in proximity to large electricity users which opens opportunities for commercial PPAs (Behind the meter connection Or Wheeling to a 3rd party off-taker).

Development's like the proposed project has an approximate construction timeline of 12 months and is due to operate for a period of 25 years. Should it be decided not to extend the operational lifespan of the project beyond 25 years, the project will be decommissioned. Decommissioning involves removing the solar panels

and associated infrastructures and covering the concrete footings with soil to a depth sufficient for the re-growth of natural vegetation.

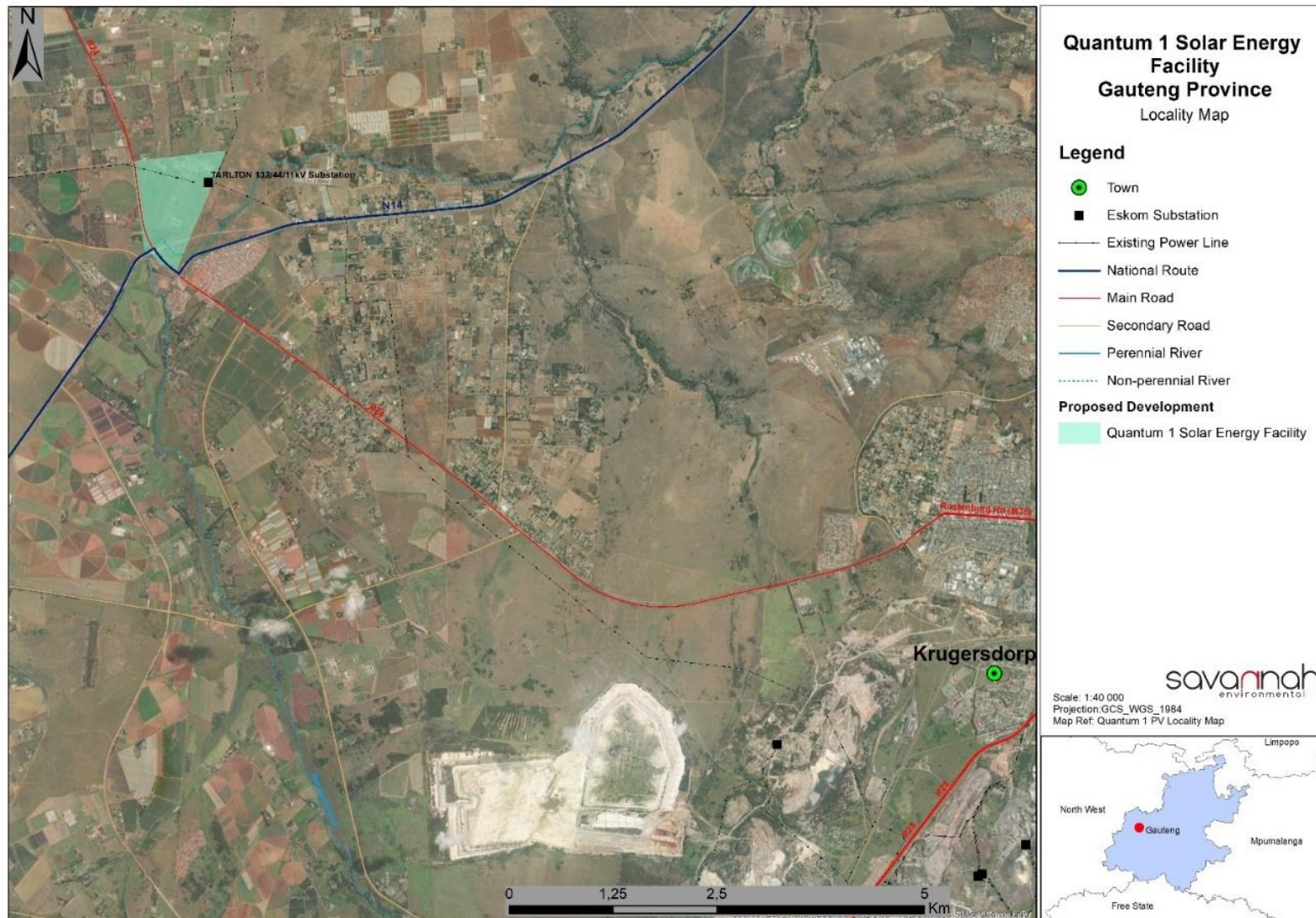


Figure 1-1: Quantum 1 Solar Energy Facility Locality Map

1.2. Objective of the Basic Assessment (BA) Process

This SIA has been prepared as part of the BA Process being undertaken for the Quantum 1 Solar Energy Facility and associated infrastructure. The purpose of this SIA is to provide details on the nature and extent of the Quantum 1 Solar Energy Facility and associated infrastructure, and the potential social impacts associated with the construction, operation, and decommissioning of the project. The inputs contained within this SIA are intended to provide an overview of the social environment within which the project is proposed and set the scene for issues which have been addressed in detail as part of the BA process specialist investigations.

The objective of this SIA is therefore to:

- » Identify 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 and assess potential impacts and risks associated with the preferred activity and technology alternatives.
- » 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.

1.3. Details of the Independent Specialist

This SIA has been undertaken by Cornelius Holtzhausen of Savannah Environmental.

Cornelius Holtzhausen - is registered with the International Association for Public Participation, South Africa and holds an MSocSci in Cultural Anthropology as well as a postgraduate degree in Social Impact Assessment and Public Participation. He has produced a growing list of social impact reports for a wide range of projects.

1.4. Structure of the SIA Report

This SIA has been structured as follows:

- » **Chapter 1** provides the introduction to the proposed project and the project description.
- » **Chapter 2** provides an overview of the methodology and approach utilised in preparing this SIA.
- » **Chapter 3** provides an overview of the legislative and policy environmental within which Quantum 1 Energy Facility is proposed.
- » **Chapter 4** provides the socio-economic profile of the Mogale City Local Municipality, West Rand District Municipality and South Africa as a whole.
- » **Chapter 5** describes and assesses the potential social impacts which have been identified for the project.
- » **Chapter 6** provides the conclusion of the SIA and recommendations.

This SIA Report has been prepared in accordance with the requirements of Appendix 6 of the 2014 EIA Regulations, as amended. An overview of the contents of this SIA Report, as prescribed by Appendix 6 of the 2014 EIA Regulations (GNR 326), and where the corresponding information can be found within the report is provided in **Error! Reference source not found..**

Table 1-1: Specialist report requirements

Requirement	Location in Report
(a) Details of – (i) The specialist who prepared the report. (ii) The expertise of that specialist to compile a specialist report including a curriculum vitae.	Chapter 1
(b) A declaration that the specialist is independent in a form as may be specified by the competent authority.	Page ii: Specialist Declaration of Interest
(c) An indication of the scope of, and the purpose for which, the report was prepared.	Chapter 1
(cA) An indication of the quality and age of base data used for the specialist report.	Chapter Error! Reference source not found.
(cB) A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change.	Chapter Error! Reference source not found.
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment.	Chapter Error! Reference source not found.
(e) A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used.	Chapter Error! Reference source not found.
(f) Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternative.	Chapter 4
(g) An identification of any areas to be avoided, including buffers.	Chapter 4
(h) A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Chapter 4
(i) A description of any assumptions made and any uncertainties or gaps in knowledge.	Chapter 2
(j) A description of the findings and potential implications of such findings on the impact of the proposed activity or activities.	Chapter 6
(k) Any mitigation measures for inclusion in the EMPr.	Chapter Error! Reference source not found.
(l) A description of any consultation process that was undertaken during the course of preparing the specialist report.	Chapter 2
(m) A summary and copies of any comments received during any consultation process and where applicable all responses thereto.	To be included in the Final BAR
(n) Any other information requested by the competent authority.	N/A
2. Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

2. METHODOLOGY AND APPROACH

2.1. Purpose of the Study

The International Principles for Social Impact Assessment define SIA as:

"The processes of analysing, 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 well-being 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 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. Approach to the Study

This SIA Report provides a snapshot of the current social setting within which the Quantum 1 Solar Energy Facility is proposed. It provides an overview of the manner and degree to which the current status quo is likely to change or be impacted by the construction, operation, and decommissioning of the project, as well as the way the social environment is likely to impact the development itself.

An overview of the assessment methodology utilised as a part of this SIA is provided in Section Error! Reference source not found..

The SIA process comprised the following:

- » Collection and review of existing information, including national, provincial, district, and local plans, policies, programmes, census data, and available literature from previous studies conducted within the area. Project specific information was obtained from the project proponent.
- » Collection of primary data.
- » Identification and assessment of potential direct, indirect and cumulative impacts likely to be associated with the construction, operation, and decommissioning of the proposed project. Impacts associated with construction can also be expected to be associated with the decommissioning phase (however, to a lesser extent as the project site would have previously undergone transformation and disturbance during construction)
- » Preparation of an SIA Report for inclusion in the BA Report to be prepared for the project.

2.2.1. Collection and Review of Existing Information

Existing desktop information that has relevance to the proposed project, project area and / or surrounds was collected and reviewed. The following information was examined as part of this process:

- » Project maps and layouts.
- » Google Earth imagery.
- » A description of the project (as provided by the project proponent).
- » Responses to questions posed to the project proponent regarding employment and social upliftment and local economic development opportunities (as provided by the project proponent).
- » Census Data (2011), and the Community Survey (2016).
- » Planning documentation such as Provincial Growth and Development Strategies (PGDSs), Local and District Municipality Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs), and development goals and objectives.
- » Relevant legislation, guidelines, policies, plans, and frameworks.
- » Available literature pertaining to social issues associated with the development and operation of solar PV power plants and associated infrastructure.

2.2.2. Collection of Primary Data

Primary data was collected through in-person interviews, and a site visit on the 7th of June 2023. Further telephonic interviews were conducted in the subsequent days. Landowners and other Interested and Affected parties were approached regarding the project, requesting comment and more information about the area and the potential social impact the project could have. Details on the meetings and site visit are included in Appendix B.

2.2.3. Assessment of Impacts

Impacts likely to be induced by the proposed development have been identified taking into consideration outcomes of the site visits and interviews, other specialists findings undertaken as part of the BA process, similar projects and specialists' knowledge and experience. Indirect impacts (cumulative) likely to be

induced by the identified proposed development impacts have also been included in the report, including impacts likely to emanate because of the potential no-development option.

The impact rating was undertaken using a matrix selection process, the most used methodology, for determining the significance of potential environmental impacts/risks. This methodology takes into account two aspects for assessing the potential significance of impacts, namely occurrence and severity, which are further sub-divided into the following categories in **(Table 2-2)**

Table 2-1: Impact Assessment Factors

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Scale/extent of impact	Magnitude of impact

Table 2-2: Impact assessment scoring methodology

Value	Description
Magnitude	
10	Very high/ unknown
8	High
6	Moderate
4	Low
2	Minor
Duration	
5	Permanent (impact continues post closure)
4	Long Term (>15 years)
3	Medium-term (5-15 years) (Impact ceases after the operational phase)
2	Short -term (2-5 years) (impact ceases after the construction phases)
1	Immediate (0-1 year)
Scale/ Geographic Extent	
5	International
4	National
3	Regional
2	Local
1	Site Only
0	None
Probability	
5	Definite/ Unknown (impact will definitely occur)
4	Highly Probable (most likely, 60% - 90% chance)
3	Probable (40% - 60% chance)
2	Low Probability (5% - 40% chance)
1	Improbable (less than 5% chance)
0	None

Significance Points = (Magnitude + Duration + Scale) x Probability.

Table 2-3: Significance of impacts based on point allocation.

Points	Significance	Description
SP>60	High environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30-60	Moderate environmental significance	An impact or benefit which is sufficiently important to require management, and which could have an influence on the decision unless it is mitigated.
SP<30	Low environmental significance	Impacts with little real effect and which will not have an influence on or require modification of the project design.
+	Positive impact	An impact that is likely to result in positive consequences/ effects

2.2.4. Mitigation measures

The significance of an impact indicates the level of mitigation measures required to minimise negative impacts and enhance positive impacts during the various project phases. Suitable and appropriate mitigation measures have been identified for each potential impact based on specialist recommendations and expertise.

2.3. Limitations and Assumptions

- » Data derived from the 2011 Census documents from Gauteng Province, West Rand Municipality and Mogale City Local Municipality was used to generate the majority of information provided in the baseline profile of the study area. The possibility therefore exists that the data utilised may be out of date and may not provide an accurate reflection of the current status quo.
- » This SIA Report is intended to provide an overview of the current social environmental and assist in the identification of potential social impacts.
- » This SIA Report was prepared based on information which 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.
- » Some of the project projections reflected in this SIA Report (i.e., with regards to job creation and local content) may be subject to change, and therefore may be higher or lower than those estimated by the project proponent.

- » It is assumed that the motivation for, and 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.

3. LEGISLATION AND POLICY REVIEW

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)
- » White Paper on Renewable Energy (2003)
- » National Energy Act (No. 34 of 2008)
- » Integrated Energy Plan (IEP) (2016)
- » National Development Plan (NDP) 2030 (2012)
- » Integrated Resource Plan for Electricity (IRP) 2010 – 2030, Updated Report (2013)

Provincial Policy and Planning Context:

- » Growing Gauteng Together 2030 (2020)
- » Gauteng City Region Over-arching Climate Change Response Strategy and Action Plan (2020)
- » Gauteng Integrated Energy Strategy (2010)
- » Gauteng Spatial Development Framework 2030 (2022)

Local Policy and Planning Context:

- » West Rand District Municipality Spatial Development Framework (2014-2017)
- » West Rand District Municipality Integrated Development Plan (2022-2023)
- » Mogale City Local Municipality Integrated Development Plan (IDP) (2022-2023)

3.1. National Policy and Planning Context

Any project which contributes positively towards the objectives mentioned within national policies could be considered strategically important for the country. A review of the national policy environment suggests that the increased utilisation of Renewable Energy (RE) sources is considered integral to reducing South Africa's carbon footprint, diversifying the national economy, and contributing towards social upliftment and economic development. As the project comprises a RE project and would contribute RE supply to provincial and national targets set out and supported within these national policies, it is considered that the project fits within the national policy framework.

A brief review of the most relevant national legislation and policies is provided in table format (**Table 3.1**) below.

Table 3.1: Relevant national legislation and policies for the Quantum 1 Solar Energy Facility

Relevant legislation or policy	Relevance to the proposed project
Constitution of the Republic of South Africa, 1996	<p>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.</p> <p>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.</p>
National Environmental Management Act (No. 107 of 1998) (NEMA)	<p>This piece of legislation is South Africa's key piece of environmental legislation and sets the framework for environmental management in South Africa. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights.</p> <p>The national environmental management principles state that the social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.</p> <p>The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.</p>
White Paper on the Energy Policy of the Republic of South Africa (1998)	<p>The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa's energy security. This can be achieved through increased use of RE and encouraging new entries into the generation market. South Africa has an attractive range of cost-effective renewable resources, taking into consideration social and environmental costs. Government policy RE is thus concerned with meeting the following challenges:</p> <ul style="list-style-type: none"> » Ensuring that economically feasible technologies and applications are implemented. » Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options. » Addressing constraints on the development of the renewable industry. <p>The policy states that the advantages of renewable energy include minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include higher capital costs in some cases; lower energy densities; and lower levels of availability, depending on specific conditions, especially with sun and wind-based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future. The White Paper on Energy Policy, therefore, supports the advancement of renewable energy sources and ensuring energy security through the diversification of supply.</p>

Relevant legislation or policy	Relevance to the proposed project
<p>White Paper on Renewable Energy (2003)</p>	<p>The White Paper on Renewable Energy supplements the White Paper on Energy Policy, which recognises that the medium and long-term potential of renewable energy is significant. This Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.</p> <p>What is being proposed now is a strategic programme of action to develop South Africa's renewable energy resources, particularly for power generation or reducing the need for coal-based power generation. Renewable energy has been recognised in the Integrated Energy Plan (IEP) (DME, 2003) developed by the DME.</p> <p>Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidised alternative to fossil fuels. The proportion of final energy consumption currently provided by renewable energy has come about largely as a result of poverty (e.g. fuelwood and animal waste used for cooking and heating).</p> <p>Strategic goals and supporting objectives will be instrumental in facilitating the development of an enabling framework in order for Government to meet its commitment to promoting renewable energy. Four key strategic areas have been addressed, i.e. financial instruments, legal instruments, technology development, and awareness raising, capacity building and education.</p> <ul style="list-style-type: none"> » Financial Instruments: The goal is to promote the implementation of sustainable renewable energy through the establishment of appropriate financial instruments. » Legal Instruments: The goal is to develop, implement, maintain and continuously improve an effective legislative system to promote the implementation of renewable energy. » Technology Development: The goal is to promote, enhance and develop technologies for the implementation of sustainable renewable energy. » Awareness Raising, Capacity Building and Education: The goal is to develop mechanisms to raise public awareness of the benefits and opportunities of renewable energy
<p>National Energy Act (No.34 of 2008)</p>	<p>The purpose of the National Energy Act (No. 34 of 2008) is 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, while taking environmental management requirements into account. In addition, the Act also provides for energy planning and increased generation and consumption of Renewable Energies (REs). The objectives of the Act, are to amongst other things, to:</p> <ul style="list-style-type: none"> » Ensure uninterrupted supply of energy to the Republic. » Promote diversity of supply of energy and its sources. » Facilitate energy access for improvement of the quality of life of the people of the Republic. » Contribute to the sustainable development of South Africa's economy. <p>The National Energy Act therefore recognises the significant role which electricity plays in growing the economy while improving citizens' quality of life. The Act provides the legal framework which supports the development of RE facilities for the greater environmental and social good and provides the backdrop against which South Africa's strategic planning regarding future electricity provision and supply takes place. It also provides the legal</p>

Relevant legislation or policy	Relevance to the proposed project
	<p>framework which supports the development of RE facilities for the greater environmental and social good.</p>
<p>Integrated Energy Plan (IEP) (2016)</p>	<p>The Integrated Energy Plan (IEP) (which was developed under the National Energy Act (No. 34 of 2008)), recognises that energy is essential to many human activities, and is critical to the social and economic development of a country. The purpose of the IEP is essentially to ensure the availability of energy resources, and access to energy services in an affordable and sustainable manner, while minimising associated adverse environmental impacts. Energy planning therefore needs to balance the need for continued economic growth with social needs, and the need to protect the natural environment.</p> <p>The IEP is a multi-faceted, long-term energy framework which has multiple aims, some of which include:</p> <ul style="list-style-type: none"> » To guide the development of energy policies and, where relevant, set the framework for regulations in the energy sector. » To guide the selection of appropriate technologies to meet energy demand (i.e. the types and sizes of new power plants and refineries to be built and the prices that should be charged for fuels). » To guide investment in and the development of energy infrastructure in South Africa. » To propose alternative energy strategies which are informed by testing the potential impacts of various factors such as proposed policies, introduction of new technologies, and effects of exogenous macro- economic factors.
<p>National Development Plan 2030 (2012)</p>	<p>The National Development Plan (NDP) 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030.</p> <p>In terms of the Energy Sector's role in empowering South Africa, the NDP envisages that, by 2030, South Africa will have an energy sector that promotes:</p> <ul style="list-style-type: none"> » Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates while supporting economic growth through job creation. » Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households. » Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. <p>The NDP aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy.</p> <p>The development of the grid connection infrastructure is considered to be relevant to the plan due to the need of the infrastructure for economic growth within the Mogale City Local Municipality municipal area.</p>
<p>Integrated Resource Plan (IRP) 2010 – 2030 Updated Report (2019)</p>	<p>South Africa's National Development Plan (NDP) 2030 offers a long-term plan for the country. It defines a desired destination where inequality and unemployment are reduced and poverty is eliminated so that all South Africans can attain a decent standard of living. Electricity is one of the core elements of a decent standard of living. The NDP envisages that, by 2030, South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates; that is socially equitable through expanded access to energy at affordable tariffs; and that is environmentally sustainable through reduced emissions and pollution. In</p>

Relevant legislation or policy	Relevance to the proposed project
	<p>formulating its vision for the energy sector, the NDP took as a point of departure the Integrated Resource Plan (IRP) 2010–2030 promulgated in March 2011.</p> <p>The Aim of the IRP 2010 is to provide an indication of the country's current and forecast electricity demand and the strategy and budget necessary to meet these demands. Dentons' Africa chief Executive Officer, Noor Kapdi, in line with his duties as a member of the advisory council to the former Minister of Energy, formed part of the Advisory Commission formulated to refine and advise on both the IRP 2010 and the Energy Resources Plan.</p> <p>The Department of Energy (DOE) released the updated Draft IRP 2018 in August of the same year. The aim of the updated IRP was to address the point of departure between assumptions made in the original IRP, and the legislative mandate for electricity supply-demand optimisation based on a least-cost path. The IRP emphasised the following:</p> <ul style="list-style-type: none"> » electricity consumption continues to decline on an annual basis. Current usage is comparable to those of the year 2007. For the financial year ending March 2018 the actual total electricity consumed is some 30% less than the figure projected in the IRP 2010; » Eskom's existing generation plant performance is not at expected levels. Eskom's own reports show that plant availability is below the IRP 2010 assumptions of 80% and above; » to date, an additional 18,000MW of new generation capacity in the form of coal, pumped storage and renewable energy has been committed to, with most of the capacity already connected to the grid and the rest to be realised by 2022; » reduced cost of new generation technologies; » actualisation of the least-cost option; » reduced carbon emission obligations on South Africa; and » the phased decommissioning of Eskom's power generation facilities as they reach the end of their life spans over the next 32 years. <p>The envisaged energy mix by 2030 will consist of 34,000MW of coal (46%); 1,860MW of nuclear (2.5%); 4,696MW of hydro (6%); 2,912MW of pumped storage (4%); 7,958MW of solar PV (10%); 11,442MW of wind (15%); 11,930MW of gas (16%) and 600MW of concentrated solar power (1%).</p> <p>According to the IRP (2019), Solar PV, wind and CSP with storage present an opportunity to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Renewable technologies also present huge potential for the creation of new industries, job creation and localisation across the value chain.</p>

3.2. Provincial Policies

This section provides a brief review of the most relevant provincial policies. The proposed Quantum 1 Solar Energy Facility and associated infrastructure is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

A brief review of the most relevant provincial policies is provided in table format (**Table 3.2**) below.

Table 3.2: Relevant provincial policies for the Quantum 1 Solar PV Energy Facility

Relevant legislation or policy	Relevance to the proposed project
Growing Gauteng Together 2030, 2019	Gauteng is the economic hub of South Africa. The province is the seventh largest economy in Africa, the 26th largest urban region in the world and the 6th largest urban agglomeration on

Relevant legislation or policy	Relevance to the proposed project
	<p>the continent. It is both the financial and technological nerve centre of Africa. The GGT2030 reflects how the GCR seeks to address the fundamental problems facing the residents of Gauteng:</p> <ul style="list-style-type: none"> » Unemployment » Poverty and hunger » Crime and Substance abuse » Climate change » Unsustainable growth and economic crises » Migration » Flight and displacement » Health » Inequality » Social exclusion » Lack of decent work and social protection » Political instability, insecurity, and violent conflicts <p>In response to the global and domestic challenges that confront the province, the government has committed to a plan of Growing Gauteng Together 2030 - or GGT2030, as it is referred to. The plan reflects a collective vision for the GCR in a decade's time, and beyond, in that it also highlights priority actions and measures of success.</p> <p>The Solar PV and infrastructure development will contribute to sustainable and economic development goals of the GGT2030, once completed and formally adopted.</p>
<p>Gauteng City Region Over-arching Climate Change Response Strategy and Action Plan 2020</p>	<p>The Gauteng City Region Over-arching Climate Change Response Strategy and Action Plan provides a consolidated short to medium plan to boost this role by defining ambitious targets and detailed interventions working towards a more carbon efficient local economy.</p> <p>In order to identify actions or interventions that can address both adaptation and mitigation, and find synergy and alignment between the two response components, adaptation outcomes and mitigation responses can be integrated into major strategic directions that determine trajectories. These key decisions act like business models that determine which actions are possible, and which are not in alignment with the overall objectives.</p> <p>1. Decarbonisation of energy, transport, industry, mining and the general built environment</p> <p>The decarbonisation of sectors with the highest carbon footprints is important from a mitigation perspective. The mining sector alone consumes about 15% of Eskom's annual electricity output, with gold (47%) and platinum (33%) mining (i.e. the two main underground mining industries in the country) being the largest contributors to this demand. At the downstream level, industrial sectors account for a further 25% of the utility's generation (Montmasson-Clair, 2016). The aim is, however, to achieve GHG emissions reductions without compromising on positive adaptation outcomes or the cost efficiency of mitigation. The integrated strategic direction should therefore select mitigation targets and interventions that are the most cost-efficient, and focus on interventions that result in co-benefits.</p> <p>2. Institutional changes to facilitate an energy, transport and development planning transition</p> <p>Because of the challenges being faced and opportunities being created within the energy, industry, transport and development planning sectors, specifically due to the rapid rise of renewable energy and information technologies, institutional changes will be required to</p>

Relevant legislation or policy	Relevance to the proposed project
	<p>accommodate the inevitable changes - on the one hand, current procedures and operational parameters will need to be adjusted to accommodate new and changed technologies and methods, but institutions will also need to reconsider their involvement in the sectors to protect sources of revenue and disengage from detrimental external factors.</p> <p>3. Resilient built environment</p> <p>A resilient built environment is a so-called 'no-regrets' decision. This suggests that by creating a built environment that is better able to withstand and recover from shocks, an improved living space is created irrespective of whether climate change leads to serious impacts. Such a resilient built environment will capitalise on ecosystem goods and services, optimise resource use and withstand impacts from climatic changes. A resilient built environment will necessarily also invest in energy saving measures, decentralised renewable energy solutions (solar, micro-hydro, biogas), improved sanitary conditions and the protection of clean water resources.</p> <p>4. Resilience supported through protection of key natural systems, functions and resources</p> <p>Many opportunities exist in urban environments to supplement or replace built (hard) infrastructure with natural (soft) solutions or 'green infrastructure' - for example functional open space networks that support stormwater management, microclimatic control, pest management, pollination services, water purification etc. Also, in rural areas, such functional ecosystems will support agricultural activities, water resources management and sustainable livelihoods. Investment in natural resources management furthermore supports the conservation of water resources.</p> <p>5. Climate change awareness and awareness materials</p> <p>If wide-spread support and action is to be mobilised with the aim of achieving the adaptation and mitigation outcomes, then a general awareness should be created of both the threats posed by climate change and the opportunities that can be capitalised on. The message must reach vulnerable social groups that need to increase their state of resilience, government employees who need to lead a systematic transition, the new generation of climate-conscious world citizens that are currently in school, as well as economic sectors that are key to a reduced carbon footprint. The existing initiatives within various spheres of government, notably the on-going mobilisation campaign around climate education and awareness should be extended. These should be incorporated into programmes run by Environmental Empowerment services in GDARD.</p> <p>6. Climate smart agriculture</p> <p>Climate smart agriculture suggests an approach that carefully manages agricultural ecosystems for improved productivity, profitability and food security, while maintaining the integrity of the natural resource base. It steers agricultural activities towards sustainable practices, climate resilient product selection and opportunities to benefit from ecosystem services. Therefore it can be extended into agro-ecology and Ecosystem-Based Adaptation (EbA) initiatives where appropriate.</p> <p>7. Climate change and ecosystem services responsive DRM capacity building</p>

Relevant legislation or policy	Relevance to the proposed project
	<p>In order to mitigate the impact of climate change, the DRM and social development sectors need to respond to the changing risk profile of economic sectors and communities. This implies that the projected extreme climate events need to be planned for, and that inevitable changes to economic activities, such as contraction in energy or water dependent industries, have to be anticipated in terms of social impacts. An opportunity to be exploited lies in the need for standardisation of DRM protocols throughout the province – this process can include an internalisation of ecosystem services.</p> <p>8. Water conservation and demand management</p> <p>Water is a scarce resource in South Africa, and the GCR is heavily dependent on imported water. The overall sustainability of water supplies in the face of ever-growing demands is therefore a concern that needs to be tempered through resource planning and water use management. The water losses are of particular concern. Rand Water (the biggest Water Board in the country) provided on average 4 684 Ml/d in 2015/6 while the levels of non-revenue losses fluctuated between 40% and 77% (GDARD, 2017a). With Johannesburg charging R7.14/kl for any consumption above 6 kl, this loss represents about R13.4 million a day. Irrigation losses can also be in order of 50%.</p> <p>9. Innovative solutions to services provision</p> <p>Although great strides have been made in providing formal basic services to communities throughout the GCR, backlogs and unserved areas remain. The reality is that current models of services provision will not be able to satisfactorily provide formal services to these areas. Innovative and 'alternative' solutions will therefore need to supplement the provision of services – such as off-grid systems and renewable energy-based solutions. A shift to entrepreneurial urban governance (see more detailed explanations in later chapters) is one of the possible solutions. Given the finite resources available to the Health Sector, innovation will also be required in the field of community health in order to accommodate the anticipated increase in climate related health impacts.</p>
<p>Gauteng Integrated Energy Strategy 2010</p>	<p>The Gauteng Energy Strategy (GIES) was developed in response to the challenges associated with global climate change, the global economic meltdown and the electricity crisis in South Africa. The strategy aims to improve Gauteng's environment, reduce Gauteng's contribution to climate change and tackle energy poverty, whilst at the same time promoting economic development in the province. The purpose of the Gauteng Integrated Energy Strategy and Implementation Plan is to direct the way that energy is supplied and used within the Gauteng province during the next 4 years (2014); 15 years (2025); 45 years (2055) and beyond, in an integrated and sustainable manner.</p> <ul style="list-style-type: none"> » The Strategy is premised on the following key goals: » Province to provide the leadership and institutional framework required to drive the strategy forward. » Implement strong energy efficient measures. » Pave the way to develop and grow renewable and alternative energy options. » Support the move towards a low carbon economy. » Prioritise energy security and access to safe, clean, and affordable energy. » Develop and grow the alternative and energy efficiency industry as a critical aspect of Gauteng's economy.

Relevant legislation or policy	Relevance to the proposed project
	<p>The strategy has major policy implications for Gauteng Province. Some of the key implications include:</p> <ul style="list-style-type: none"> » Advocating maximizing the use of local energy resources such as landfill gas, efficient water heating and solar energy. » Shifting to a low carbon economy will affect the kinds of industries that emerge into the future given that Gauteng is the economic hub of the country, and will require a carefully thought through growth path which identifies and exploits opportunities in such a low-carbon trajectory. Current industries will also need to further adapt and look at their carbon footprint. » Moving towards an integrated approach to energy planning. » Provincial commitments to RE and EE targets. » The implications of the above for job creation generally within the province. » Using the development of the renewable energy industry as an employment creation opportunity, and as a means of developing local industry and SMMEs - all of which will impact on poverty. » Mass roll out of skills enhancement and capacity building within province which will require both policy and operational changes in order to implement. » Province leading by example has implications in terms of implementation both at provincial and municipal levels from a policy and financial perspective and will require both structural and procurement changes.
<p>Gauteng Spatial Development Plan 2030</p>	<p>The Gauteng Spatial Development Plan (GSDP) 2030 aspires to establish a balanced, polycentric spatial network, with strong and resilient nodes enabling mutually beneficial exchanges of goods and services, and the movement of people.</p> <p>To support the establishment of this polycentric form, four spatial development strategies are to be followed:</p> <ul style="list-style-type: none"> » Capitalising on proximity, by directing higher densities closer to economic nodes and public transport networks, and improving conditions in areas closer to economic opportunities, to ensure even greater benefits for the people and economy of these areas. » Managing new settlement development, to prioritise infill development and densification, rather than expanding residential development outwards, so new settlements are functional and integrated units of the polycentric provincial network and based not only on the availability of land. » Building an economic network, through a system of high-order nodes and activity corridors, developing economic clusters that benefit from synergies and unlock the advantages of agglomeration. » Creating a viable and productive hinterland, by protecting valuable resources and high potential agricultural land from harmful development and managing water resources fugally and effectively. <p>The GSDP notes that the province's need for energy is increasing but still relies heavily on coal to generate energy. Alternative, renewable, and suitable energy sources need to be developed. The GSDP 2030 also notes as one of its key policy objectives, the development and protection of natural resources. This would be accomplished through curbing emissions through developing more sustainable electricity supply and making industrial, commercial and mining operations and buildings more energy efficient.</p>

3.3. District and Local Municipalities Policies

The strategic policies at a district and local level have similar objectives for the respective areas, namely, to accelerate economic growth, create jobs, and uplift communities. The proposed Quantum 1 Solar Energy Facility is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor. A brief review of the most relevant district and local municipal policies is provided in table format (**Table 3.3**) below.

Table 3.3: Relevant district and local municipal policies for the Quantum 1 Solar Energy Facility

Relevant policy	Relevance to the proposed project
<p>West Rand District Municipality Spatial Development Framework (SDF) (2014-2017)</p>	<p>The purpose of the West Rand District Spatial Development Framework (WRSDF) is to provide guidance regarding a preferred development approach. The spatial development framework (SPF) ensures that development does in actual fact take place in an integrated and sustainable manner in order for the Integrated Development Plans (IDP) and Spatial Development Frameworks of local and district authorities to be aligned with the goals and directives provided by the Spatial Planning and Land Use Management Act and new national and provincial policy documents.</p> <p>The SDF suggest the following twelve development principles that represent the building blocks to the WRSDF:</p> <ul style="list-style-type: none"> » Consolidate and protect environmentally sensitive areas to ensure long term environmental sustainability. » Enhance spatial efficiency by defining a range of urban and rural nodes in the district around which to consolidate economic development and infrastructure investment. » Establish a comprehensive movement network to link all activity nodes within the district and beyond, and to promote corridor development through land use-transportation integration. » Consolidate the tourism character of the district around the cradle of humankind as part of the regional Cradle-Hartbeespoort Dam-Magaliesberg-Pilanesberg Tourism Complex. » Optimise agricultural production and processing in and around the two agricultural hubs in the district. » Utilize the mining potential of the district along the southern mining belt in a sustainable, well-managed manner. » Expand and consolidate industrial development along newly identified development corridors, around existing industrial areas and at rural nodes. » Actively manage and maintain highest order business nodes (CBD's) in the district to accommodate retail, office and residential uses and timeously implement urban renewal programmes where necessary. » Achieve urban restructuring and spatial justice by consolidating mixed income residential development in well-located strategic development areas. » Facilitate urban restructuring in the district by way of implementation of growth management instrument like the urban development boundary as part of a comprehensive growth management strategy. » District infrastructure investment towards the activity nodes in the district strategic development areas earmarked for residential development, and communities with excessive services backlogs. » Consolidate community facilities at strategic locations to enhance access to such facilities for the community, and to contribute towards creating "critical mass" required to stimulate local economic development – especially in rural areas and at rural nodes. <p>Finally, as part of the vision of the WRSDF, the strategy includes the creation of new independent power producers to generate renewable, affordable, and reliable energy to power new industries and create competitive advantages.</p>

Relevant policy	Relevance to the proposed project
<p>West Rand District Municipality Integrated Development Plan (2022-2023)</p>	<p>The West Rand District Municipality Integrated Development Plan (WRDMIDP) aims to provide an integrated and excellent developmental district governance system in the West Rand.</p> <p>The sixteen Development Priorities over the five-year term as contextualised by the Executive Mayor are as the follows:</p> <ul style="list-style-type: none"> Priority 1 - End / Reduce Poverty and Ensure Zero Hunger Results Priority 2- Good Health and Wellbeing / Healthy Communities Results Priority 3 - Quality Education Results Priority 4 - Gender Equality Results Priority 5 - Clean water and sanitation Result Priority 6- Affordable Clean Energy Results Priority 7 - Decent Work and Economic growth Priority 8 - Industry, innovation, and Infrastructure Priority 9 - Reduced Inequalities Priority 10 - Sustainable communities Priority 11 - Peace Justice and Strong institutions Priority 12 - Partnership for Goals Priority 13 - Be Tough on Crime Priority 14 - Safe Working environment Priority 15 Accountable Municipal Administration Priority 16 - End Corruption in all forms
<p>Mogale City Local Municipality Integrated Development Plan (IDP) (2022-2023)</p>	<p>The Integrated Development Plan enhances integrated service delivery and development, promotes sustainable, integrated communities, providing a full basket of services, as sustainable development of communities cannot be developed in a fragmented manner. 2022/23 draft IDP has been prepared against the backdrop of Mogale City Local Municipality's (MCLM) primary objective, which is in line with the government's aim of addressing the challenges of major socio-economic issues including poverty, inequality, climate change related disasters, safety, and unemployment in the country.</p> <p>the city has developed a Climate Change Strategy and Operational Framework to reduce vulnerability and built resilience (adaptation) against the negative impacts of climate change. The strategy further aims to set-out the path to which the MCLM could put measures to minimize the climate change impacts, reduce greenhouse gas emissions footprint and improve its resilience through adaptation and mitigation means. The Strategy was further intended to raise climate change awareness and establish interdepartmental linkage in response to the MCLM's overarching climate change impacts. Thus, mainstreaming of the MCLM's Climate Change Response Plans will improve and inform cross-cutting sector planning and management as well as the flow of information on possible risks (floods, hail) affecting service delivery.</p> <p>A number of projects are currently underway that give effect to the strategy, which includes among others, the promotion of water conservation mechanisms, implementation of energy efficiency projects, support to projects that promote food security, and mainstreaming of climate change at planning level especially on land use management issues.</p>

Implementation of the Quantum 1 Solar Energy Facility would contribute in a small way towards addressing the key issues regarding high levels of poverty and unemployment, skills shortage, and inequality through the creation of employment opportunities, the provision of skills training opportunities, and local economic

growth, including growth in personal income levels of those community members who would be employed during the construction, operation, and decommissioning phases of the project.

The review of relevant legislation, policies and documentation pertaining to the energy sector indicate that renewable or green energy (i.e. energy generated by naturally occurring renewable resources) and therefore the establishment of the Quantum 1 Solar Energy Facility is supported at a national, provincial, and local level, and that the proposed project will contribute positively in a small way towards a number of targets and policy aims; specifically those relating to employment creation, social and economic development and upliftment, and an increase in renewable energy and electricity supply which has the potential to further improve individuals' standard of living.

4. SOCIAL PROFILE

The Quantum 1 Solar Energy Facility, including its associated infrastructure, is proposed on Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160, located approximately 7.2km east of Krugersdorp, within the Mogale Local Municipality in the West Rand District Municipality in the Gauteng Province (Refer to **Table 4-1**).

Table 4-1: Spatial Context of the study area for the development of the Quantum 1 Solar PV Energy Facility and associated infrastructure

Province	Gauteng Province
District Municipality	West Rand District Municipality
Local Municipality	Mogale Local Municipality
Ward number	30
Nearest town(s)	Krugersdorp
Preferred access	The site is accessible via the rural road off the R24. An intersection from the R24 onto the N14 is located right next to the southern border of the project site.

This Chapter provides an overview of the socio-economic environment of the province, DM, and LM within which the Quantum 1 Solar Energy Facility is proposed and provides the socio-economic basis against which potential issues can be identified.

4.1. Gauteng Province

The Gauteng City-Region is an integrated cluster of cities, towns and urban nodes that together make up the economic heartland of South Africa. The core of the city-region is Gauteng, South Africa's smallest but most densely populated province. Gauteng includes the cities of Johannesburg, once the world's most important centre of gold production and today South Africa's financial capital, and Pretoria, the country's administrative capital. It also includes commercial, industrial, and mining centres such as Germiston, Springs, Alberton, Boksburg, Benoni, Vereeniging, Vanderbijlpark, Krugersdorp, Randfontein, and Westonaria. Beyond the boundaries of the Gauteng province is a wider urban region of smaller centres and population concentrations. Although Gauteng makes up 1.5% of the country's land area, it is home to more than a quarter of population. The area is highly urbanised and contains the country's largest city, Johannesburg.

Gauteng's southern border is the Vaal River, which separates it from the Free State. It also borders on the North West Province to the west, Limpopo to the north, and Mpumalanga to the east. The Gauteng province is on the Highveld which is a high-altitude grassland. Between Johannesburg and Pretoria, there are low parallel ridges and undulating hills, some of the Magaliesberg Mountains and the Witwatersrand.

Gauteng contributes heavily in the financial, manufacturing, transport, technology, and telecommunication sectors, among others. It also plays host to a many overseas companies and is considered the financial gateway to Africa.

4.2. West Rand District Municipality

The West Rand District Municipality (WRDM) is a Category C municipality located in the west of the Gauteng Province and consists of three local municipalities (see **Figure 4-1**) namely: Mogale City Local Municipality, Merafong City Local Municipality and Rand West City Local Municipality – is home to the Cradle of the Humankind World Heritage Site and is about 50 minutes from OR Tambo International Airport. It borders the North West Province. Towns in the region include Krugersdorp, Randfontein, Westonaria, and Carletonville.



Figure 4-1: Local Municipalities in West Rand District Municipalities

The DM is surrounded by the Bojanala District Municipality to the north, the City of Tshwane to the north-east, the City of Johannesburg to the east and the Sedibeng District Municipality to the south-east. The West Rand District consists of three local municipalities: Mogale City, Merafong City and Rand West City. The West Rand District Municipality extends over 4 087km² from its seat in Randfontein. To its east it shares a boundary with the City of Johannesburg. To its west and south west it shares boundaries with the Bojanala Platinum District and Dr Kenneth Kaunda District, of the North West Province. To the north east it shares boundaries with the City of Tshwane. To its south east it shares a boundary with Sedibeng District of Gauteng. West Rand District is located on the south western edge of Gauteng Province and is traversed by major national roads, namely the N12 and N14.

In 2018, the West Rand was estimated to have contributed 3.8% to the economic output of the province. The sector that predominately drove the economy of the district was mining. The West Rand's economy was

expected to have been in recession in 2018, with growth contracting by 1.4% from 1% in 2017. The decline in economic growth was due to the decline in mining output. The mining sector, which accounted for roughly 30% of economic activity in West Rand, was expected to have contracted by 8% in 2018. Output in manufacturing and construction also contracted.

4.3. Mogale City Local Municipality (LM)

The Mogale City Local Municipality (LM) is largely rural but has an urban core complex which forms part of a band of development stretching from the Johannesburg Inner City. It lies directly south and west of the City of Tshwane and City of Johannesburg areas respectively. To the north, south and west it shares boundaries with the Madibeng, Rand West City and Rustenburg Local Municipalities, respectively. The rural environment is characterised by the Magaliesburg and Witwatersberg Ranges in the north-west. Rural towns in Mogale City are Tarlton, Magaliesburg and Hekpoort, located in the west. The northern part of Mogale City comprises the bulk of the Cradle of Humankind World Heritage Site.

The areas to the south of Krugersdorp, namely Kagiso, Azaadville and Rietvallei (referred to as the Kagiso complex), are predominantly disadvantaged settlements with more limited access to services and facilities. The Kagiso complex is physically separated from Krugersdorp's urban areas by an extensive mining belt that runs roughly in an east-west direction through the area. Mogale City's strongest functional urban linkage is with the City of Johannesburg. Krugersdorp and the greater Kagiso area, Mogale City's primary urban complex, forms part of a band of development stretching from the Johannesburg Inner City westwards along the mining belt up to Krugersdorp. Key cities or towns are Krugersdorp, Magaliesburg and Muldersdrift. Although mining is the core of the GVA, transport, energy, manufacturing, tourism, and agriculture are also key drivers.

4.4. Project Site

The proposed site is located on Portion 285 (a portion of portion 19) of the farm Vlakplaats 160. The site is located approximately 7.2km from Krugersdorp. The facility will have a contracted capacity of up to 10MW and will be known as Quantum 1 Solar Energy Facility. A preferred development footprint with an extent of 19.148 ha and development area of ~94.1479 ha has been identified by the South African Mainstream Renewable Power Development (Pty) Ltd as technically suitable for the development of the Quantum 1 Solar Energy Facility.

From a regional perspective, the area within the West Rand District Municipality identified for the project is considered favourable for the development of a commercial PV facility due to the low environmental sensitivity of the identified site, excellent solar resource, and availability of land on which the development can take place. There is also potential for evacuating the power to the national grid via a direct grid connection at the Eskom Tarlton 132/44/11kV substation which is adjacent to the proposed site.

As per the soil and agricultural potential assessment, the land uses in the area surrounding the project area include agriculture, grazing waterbodies, and informal settlements. The specialist further notes that the available climate limits crop production significantly. The conditions are associated with low annual precipitation and high evapotranspiration potential demands of the area, which might not be favourable for most cropping practices.

The site is accessible via a rural road off the R24. This rural road lies to the north of the site and is used by a number of people to access their respective properties, be it for housing or business. The Light Centre for Children with disabilities-Tarlton is located close to the R24 and near the start of the rural road (see **Figure 4-1**). Further down the road other businesses are present as well as some formal, semi-formal and informal housing. The persons living in these houses are either working for companies in the area, or are family of the persons working there. The proposed site is located in close proximity to three of the houses (Marked as **Housing B** in **Figure 4-1**). As such dust, noise, and other social impacts are likely to impact them directly. Further, while there are trucks that regularly use the rural road, there is bound to be a substantial increase in traffic during the construction phase. Housing C on the map is used as housing for a manager/employee at Quantum Foods. The development footprint will be much smaller than the Quantum 1 Development area and will avoid several areas of sensitivity. In particular, the development footprint places a buffer around Housing B and C. Lastly, two chicken farming facilities are located in close proximity to the proposed site. The businesses and chicken farm facilities on the proposed site are owned and part of the same company.

An intersection from the R24 onto the N14 is located right next to the southern border of the project site. A few companies are in close proximity to this intersection, including a new development. The area is however quite used to seeing heavy vehicles on the roads. Alternative roads are being considered to access the proposed site. While Krugersdorp could be considered the closest major settlement, the settlement of Tarlton can be found just south of the proposed site and the N14. This area has a few convenient stores for groceries, some fuelling stations, and a number of semi-formal and informal housing developments.

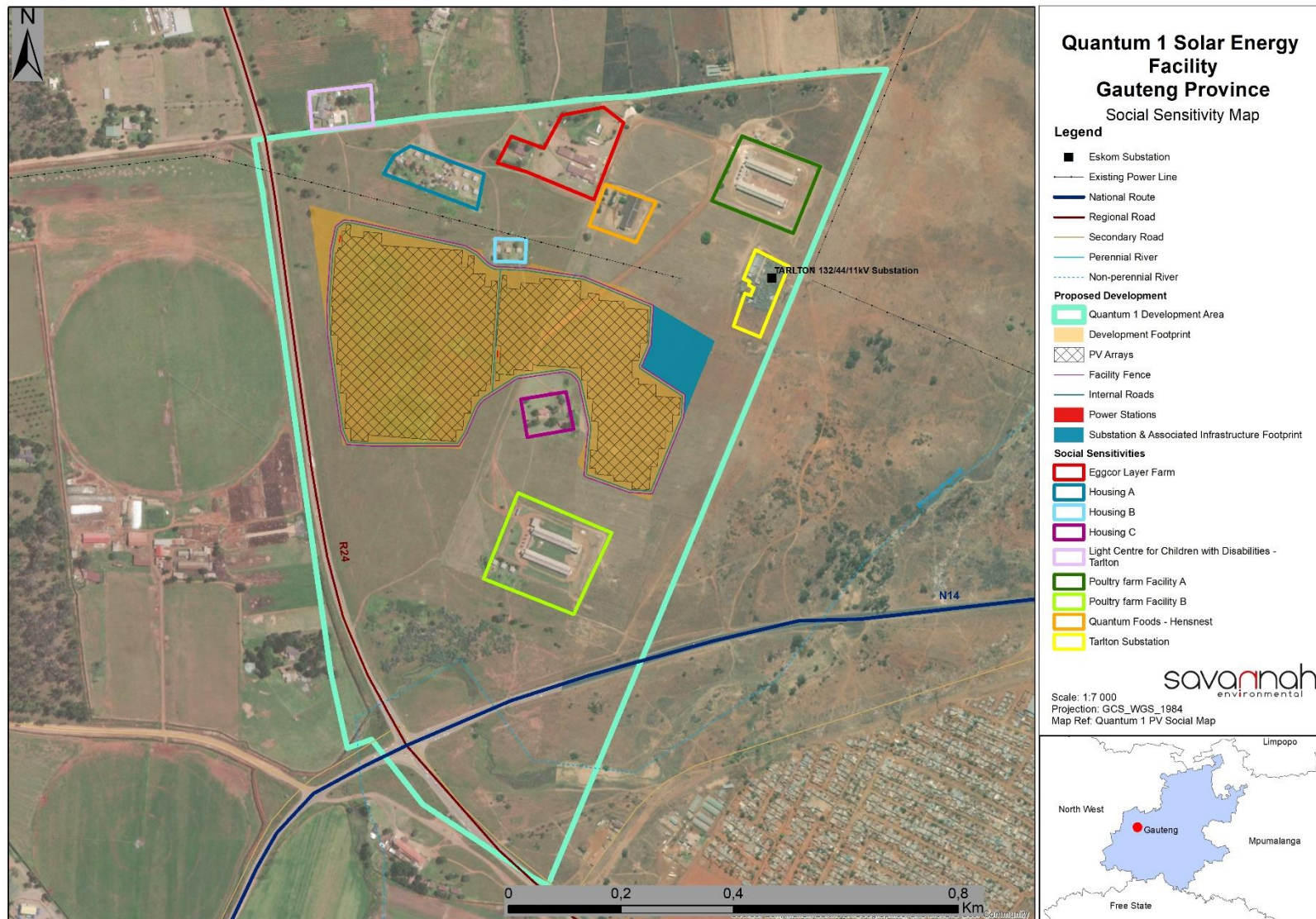


Figure 4-2: Social Sensitivity Map for the Quantum 1 Solar Energy Facility

4.5. Baseline Description of the Social Environment

Table 4.2 provides a baseline summary of the socio-economic profile of the Mogale City Local Municipality within which Quantum Solar PV Facility is proposed. To provide context against which the Local Municipality's socio-economic profile can be compared, the socio-economic profiles of the West Rand District, Gauteng province, and South Africa have also been provided where applicable. The data presented in this section have been derived from the 2011 Census, Gauteng Provincial Growth and Development Strategy (PDGS), and the Mogale City Local Municipality Integrated Development Plan (IDP).

Table 4.2: Baseline description of the socio-economic characteristics of the area within which the Quantum 1 Solar Energy Facility is proposed.

Location characteristics
<ul style="list-style-type: none"> » The project is proposed within the Gauteng Province, which shares domestic borders with the Free State, North West, Limpopo, and Mpumalanga, Provinces. » The project is proposed within the City of Mogale LM of the West Rand DM. » The City of Mogale LM is approximately 1,342 km² in extent.
Population characteristics
<ul style="list-style-type: none"> » Mogale City LM has a population of 421 087, and in the West Rand DM, 900,806 as of 2020. » Between 2016-2020 an average positive growth rate of 1.2% was observed for the DM, with a further 1.4% expected between 2021-2024. Similarly for the LM a positive growth of 1.7%, and expected growth of 1.5%, recorded respectively. » According to the Census 2011, the significant majority of 75.6% of the LM population are Black African, followed secondly by 21% which are White, 0.8% which are Coloured, and finally 2.2% Indian / Asian. » The LM has a median age of 30, which is similar to the DM (30) and Provincial figure (29). The majority of people are between 18-64 at 66%. While a further 28% are under 18 and the remaining 6% are over 65. » Setswana is the most spoken language at home at 35%, followed then by Afrikaans (16%), IsiZulu (11%), IsiXhosa (9%), English (9%), Sesotho (5%), and finally other (15%). » Regarding migration, 92.7% of residents that migrated to the area are born in South Africa, 6% have migrated from SADC countries. Around 95% have South African citizenship.
Economic, education and household characteristics
<ul style="list-style-type: none"> » Employment levels in the LM is 44%. Female employment add-up to 44,37% and male are 51,35% over the review period (2020). Unemployment rate remained at 47% which is way above National unemployment rate of 30%. » The 2011 census suggested that the LM employment are was 51.8% for the LM, 29,72% for the DM, and 50.59% for the province. » As of 2011 the average annual income in the LM area was R30 000, with the West Rand at R57 500 and the Provincial average being R57 500. » Education levels as reported in the 2016 Community Survey showed 76.5% of persons in the LM completed Grade 9 or higher. The DM has similar results at 73.54% and 78.66% for Gauteng. » Nearly 50% of persons in the LM completed matric or higher during the same period. » School attendance was at 94.5% for children aged 5 to 17 in the LM, with similar number in the DM and Province. » With an average household of 2.6, 147,153 households were recorded in the LM in 2016. » Of these households 32.3% are female headed. » 76% are considered formal dwellings in 2016, compared to 73,5% in 2011. » Nearly 45% of households are owned or in the process of being paid off in the LM.
Services
<ul style="list-style-type: none"> » The LM has 91.3% of houses getting water from a regional or local service provider, while the DM has 91.89%, and the province has 96.8%. » Around 10.7% of the population have no access to electricity in the LM, 13.66% in the DM, and 7.36% in the Province.

- » Close to 90% of the population has access to flush or chemical toilets in the LM, compared to 87% in the DM, and nearly 90% in the province.
- » Refuse removal services are available to 85.9% of households, either through local authorities, private company or community members in the LM. Similar service availability can be seen at the DM and provincial level at 83% and 88% respectively.

5. IDENTIFICATION AND ASSESSMENT OF POTENTIAL SOCIAL IMPACTS

This Chapter provides a description and assessment of the potential social impacts that have been identified, which may be associated with the development of Quantum 1 Solar Energy Facility. Potential impacts have been identified based on the current understanding of the project and the socio-economic environment within which it is proposed.

Social impacts are expected to occur during both the construction and operation phases of the associated infrastructure. 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.

5.1. Comments Raised by Interested and Affected Parties

In interviews with local I&AP (Summary added to Appendix B) it was made evident that the development would be welcomed in the area. The idea of a solar project is generally viewed in a positive light. The general consensus is that the power being generated should be used by the local community and in some way alleviate some of the loadshedding experienced in the area. There is also hope that the development would result in jobs and other business opportunities in the area. There was little to no suggestion that local communities would reject the project, or otherwise push back on the development.

There was a concern that the development would encroach on wetlands and other sensitive area, however with the sensitivity maps showing that efforts are being made to avoid sensitive areas these concerns were alleviated.

5.2. Potential Social Impacts during 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 (~9 - 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 mis-management of the construction phase activities.

The positive and negative social impacts identified that will be assessed for the construction phase include:

- » Direct employment opportunities
- » Economic multiplier effects
- » Influx of jobseekers and change in population
- » Safety and security impacts
- » Nuisance impacts, including noise and dust
- » Visual impacts and impacts on the sense of place

Table 5-1: Impact Assessment on Direct Employment Opportunities During the Construction Phase

Nature:			
Employment opportunities and skills development			
Impact description: The creation of employment opportunities and skills development opportunities during the construction phase for the country and local economy			
	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Immediate (1)	The construction period will last for one year at most	Low Positive (24)
Extent	Local – Regional (3)	The impact will occur at a local and regional 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 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 local employment, skills development and business opportunities associated with the construction phase the following measures should be implemented:			
<ul style="list-style-type: none"> » It is recommended that the local employment policy be adopted where possible to maximise the opportunities made available to the local labour force. The project should make it a requirement for contractors to implement a 'locals first' policy, especially for semi and low skilled job categories., if this is not possible, then the broader focus areas should be considered for sourcing workers. » Employment opportunities will be for the immediate local area Mogale City Local Municipality, if this is not possible, then the broader focus areas should be considered for sourcing employees. » During the recruitment selection process, consideration must be given to women. » It is recommended that realistic local recruitment targets be set for the construction phase. » Training and skills development programmes should be initiated prior to the commencement of the construction phase. 			
Post Enhancement			
Duration	Immediate (1)	The construction period will last one year at most	Moderate Positive (40)
Extent	Regional (3)	The impact will occur at a local and regional level.	
Magnitude	Moderate (6)	The creation of employment opportunities will assist to an extent in alleviating unemployment levels within the area	
Probability	Highly Probable (4)	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 Impact:			
Improved pool of skills and experience in the local area			

Table 5-2: Impact Assessment on Multiplier Effects on the Local Economy During the Construction Phase

Nature:			
Multiplier effects on the local economy			
Impact description: Significance of the impact from the economic multiplier effects from the use of local goods and services			
	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Immediate (1)	The construction period will last on year at most.	Low Positive (24)
Extent	Local – Regional (3)	Will include mostly local and some regional impacts.	
Magnitude	Low (4)	Will derive from increased cash flow from wages, local procurement, economic growth, taxes, LED and Human Resource Development (HRD) initiatives.	
Probability	Probable (3)	Will depend on proportion of local spending by employees; capacity of local enterprises to supply; effectiveness of Local Economic Development (LED) and Human Resource Development (HRD) initiatives; and contributions to local government.	
Enhancement measures:			
<ul style="list-style-type: none"> » It is recommended that a local procurement policy is adopted by the developer to maximise the benefit to the local economy, where feasible (Mogale City Local Municipality). » South Africa Mainstream Renewable Power Developments (Pty) Ltd should develop 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 tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work, where applicable. » It is a requirement to source as much goods and services as possible from the local area. » Engage with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers, where feasible. 			
Post Enhancement			
Duration	Immediate (1)	The construction period will last on year at most.	Moderate Positive (32)
Extent	Local – Regional (3)	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	Highly Probable (4)	Increased local employment and procurement as well as skilled SMMEs skill enhance the likelihood of benefits to the local economy	
Residual Impact:			
Improved local service sector and growth in local business			

Table 5-3: Impact Assessment on Safety and Security During the Construction Phase

Nature: Safety and security			
Impact description: Temporary increase in safety and security concerns associated with the influx of people during the construction phase			
	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Immediate (1)	Will be limited to the construction phase which is one year at most.	Low Negative (24)
Extent	Local – Regional (3)	Will affect road users and local residence from nearby communities.	
Magnitude	Low (4)	Could place the safety and security of neighbouring community members and road users at risk.	
Probability	Probable (3)	Fear of crime is often at high levels during the construction phase of the project.	
Mitigation:			
<ul style="list-style-type: none"> » Access in and out of the construction area should be strictly controlled by a security company. » The appointed EPC contractor must appoint a security company and appropriate security procedures are to be implemented. » The contractor must ensure that open fires on the site for heating, smoking or cooking are not allowed except in designated areas. » Contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff. » A comprehensive employee induction programme which covers land access protocols, fire management and road safety should be prepared. » A Community Liaison Officer should be appointed and an appropriate grievance mechanism implemented. 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	Immediate (1)	As for pre-mitigation	Low Negative (10)
Extent	Local (2)	Safety measures will likely restrict impacts on road users	
Magnitude	Minor (2)	Safety and security measures will reduce the magnitude of the social impact.	
Probability	Improbable (2)	As for pre-mitigation	
Residual Impact: None anticipated. Impacts will be removed once construction is completed.			

Table 5-4: Impact Assessment on Local Services/Resources During the Construction Phase

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	Immediate (1)	Will be limited to the construction phase which is one year at most.	Low Negative (27)
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 water and sanitation, and medical services.	
Probability	Probable (3)	Population influx will affect the ability of the local municipality to meet increased demand.	
Mitigation:			
» Preference should be given to local jobseekers to lessen the pressure on local services as there will not be a high number of people adding to the pressure on local services.			
Post Mitigation			
Duration	Immediate (1)	Will be limited to the construction phase which is one year at most.	Low Negative (14)
Extent	Local (2)	Project resources to manage during the construction of this project	
Magnitude	Low (4)	Appropriate mitigation will reduce the risk of this project	
Probability	Improbable (2)	Mitigation measures should alleviate the probability that pressure will increase on local services.	
Residual Impact:			
Possibility of outside workers remaining in the area after construction is completed and subsequent pressure on local infrastructure.			

Table 5-5: Impact Assessment on Nuisance Impacts During the Construction Phase

Nature:			
Nuisance impacts (noise & dust)			
Impact description: Nuisance impacts in terms of temporary increase in noise and dust, often associated with construction and the increase in heavy vehicles in the area.			
	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Immediate (1)	Dust generated from site clearance and noise during construction from equipment and other source of noise include vehicle traffic during the construction phase.	Moderate Negative (40)
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 equipment associated with construction a high potential to create noise and dust in the area.	
Mitigation Measures			
Mitigation:			
» The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays and holiday periods where feasible.			
» Dust suppression measures must be implemented on site such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers when appropriate and practical.			

<ul style="list-style-type: none"> » Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues. » A Community Liaison Officer (CLO) 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	Immediate (1)	As for pre-mitigation	Low Negative (16)
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)	Appropriate mitigation will reduce the impact of this project	
Residual Impact: None anticipated			

5.3. Potential Social Impacts during the Operation Phase

It is anticipated that the Quantum 1 Solar Energy Facility will operate for up to 25 years (which is equivalent to the operational lifespan of the project). The majority of positive outcomes are associated with the operational phase of the project. If managed appropriately, the positive impact can be effectively enhanced, and the negative impacts mitigated.

The potential positive and negative social impacts that could arise as a result of the operation of the proposed project include the following:

- » Direct employment and skills development opportunities
- » Development of clean, renewable energy infrastructure
- » Visual impact and impact on sense of place

Table 5-6: Impact Assessment on Direct Employment and Skills Development Opportunities During the Operation Phase

Nature: Direct Employment and skills development during operation			
Impact description: The creation of employment opportunities and skills development opportunities during the operation phase for the country and local economy			
	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Long term (4)	Project will be for up to 25 years	Moderate Positive (33)
Extent	Local - 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:			
<ul style="list-style-type: none"> » A local employment policy should be adopted by the developer to maximise the project opportunities being made available to the local community. » Enhance employment opportunities for the immediate local area, Mogale City Local Municipality. If this is not possible, then the broader focus areas should be considered for sourcing employees. » The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. » The developer should establish vocational training programs for the local employees to promote the development of skills. 			
Post Enhancement			
Duration	Long-term (4)	The project timeline will not change	Medium Positive (44)
Extent	Local - regional (3)	Mitigation measures are aimed at ensuring the extent remain at a local – regional extent.	
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 Impact:			
An improved pool of skills and experience in the local area			

Table 5-7: Impact Assessment on the Development of Clean, Renewable Energy Infrastructure During the Operation Phase

Nature:			
Development of clean, renewable energy infrastructure			
Impact description: Development of clean, renewable energy infrastructure			
	Rating	Motivation	Significance
Prior to Mitigation			
Duration	Long term (4)	Bringing renewable energy sector to Mogale City LM economy may contribute to the diversification of the local economy and provide greater economic stability.	Moderate Positive (48)
Extent	National (4)	The generation of renewable energy will contribute to South Africa's electricity generation capacity.	
Magnitude	Low (4)	As the project is only proposed to be 10MW, the contribution will be limited.	
Probability	Highly Probable (4)	Facility will help reduce the total carbon emissions associated with non -renewable energy generation	
Enhancement measures:			
None required.			
Post Enhancement			
Duration	Long term (4)	N/A	Moderate Positive (48)
Extent	National (4)	N/A	
Magnitude	Low (4)	N/A	
Probability	Highly Probable (4)	N/A	
Residual Impact:			
Reduce carbon emissions through the use of renewable energy and contribute to reducing global warming			

Table 5-8: Impact Assessment on The Visual Impacts and Impacts on Sense of Place During the Operation Phase

Nature: Visual impacts and impacts on sense of place			
Impact description: Visual impacts and sense of place impacts as referenced from the Visual Impact Assessment associated with the operation phase of the project			
	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	Moderate Negative (36)
Extent	Local (2)	Dependant on the demographics of the population that resides in the area and their perceptions	
Magnitude	Moderate (6)	There are already existing power and transmission lines, roads, substations and other infrastructure that affect the area.	
Probability	Probable (3)	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:			
<u>Planning:</u>			
» Retain/re-establish and maintain natural vegetation in all areas outside of the development footprint/servitude, but within the project site.			
<u>Operations:</u>			
» Maintain the general appearance of the facility as a whole.			
Post Mitigation			
Duration	Long term (4)	As for pre-mitigation	Moderate Negative (36)
Extent	Local (2)	As for pre-mitigation	
Magnitude	Moderate (6)	As for pre-mitigation	
Probability	Probable (3)	As for pre-mitigation	
Residual Impact:			
The visual impact will be removed after decommissioning, provided the facility infrastructure is removed and the area rehabilitated. Failing this, the visual impact will remain.			

5.4. Assessment of Cumulative Impacts

Cumulative impacts have been considered as this energy facility has the potential to result in significant positive cumulative impacts; specifically, since 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.

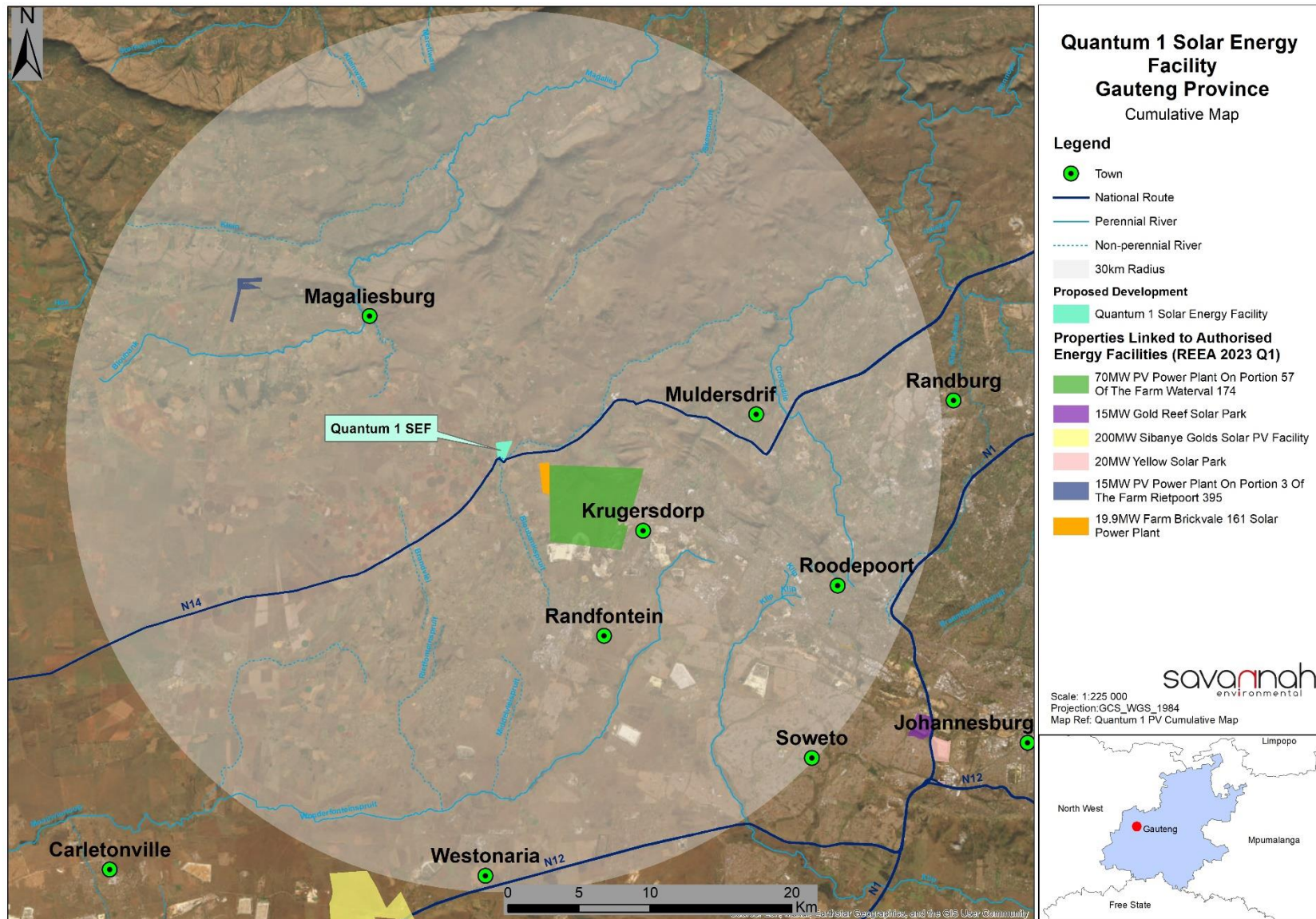


Figure 5.1: Cumulative impacts map from other nearby renewable projects

As illustrated in Figure 5.1 (above), there are a handful of other renewable projects being proposed, under-construction, or in operation within a 30km radius of the proposed project site. The Quantum 1 Solar Energy Facility is much smaller than the 70MW PV Power Plant proposed just outside of Krugersdorp. The project will however form part of a growing industry that will alleviate some of the pressures from the energy crisis in South Africa. The project will also add benefits such as skills development and job creation to the area, as well as further contributing to the local economy. Similarly it would contribute to the negative aspects of development, potentially increasing crime, change in sense of place, visual, dust, and other impacts.

Table 5-9: Positive Cumulative Impacts Associated with the Project

Nature: An increase in employment opportunities, skills development and business opportunities with the establishment of more than one solar energy facility		
	Overall impact of the proposed project considered in isolation	Cumulative impact of the project and other projects in the area
Extent	Regional (3)	Regional (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Medium (39)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impacts be mitigated?	Yes	Yes
Confidence in findings: High.		
Mitigation: The establishment of more solar energy facilities in the area has the potential to have a positive cumulative impact on the area in the form of employment opportunities, skills development, and business opportunities. The positive benefits will be enhanced if local employment policies are adopted, and local services providers are utilised where possible, by the developers to maximise the project opportunities available to the local community.		

Table 5-10: Negative Cumulative Impacts Associated with the Project

Nature: Negative An increase in security and safety risks resulting from the influx of job seekers and road activity associated with the construction and operations of similar facilities.		
	The overall impact of the proposed project considered in isolation	The cumulative impact of the project and other projects in the area
Extent	Regional (3)	Regional (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Negative (33)	Negative (39)
Status (positive or negative)	Positive	Positive
Reversibility	Yes	Yes
The irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes
Confidence in findings: High.		
Mitigation:		

The establishment of more solar facilities have the potential of exasperating the negative social impacts associated with the construction and operation of the facility. These impacts can be effectively mitigated through the implementation of good policy and measures.

5.5. Decommissioning phase Impacts

Two potential options for the project exist at the end of the project lifecycle. The project and associated infrastructure could potentially be refurbished and upgraded, or the project could be decommissioned, and the site returned to its original (current) natural state. The social impact of decommissioning the Quantum 1 Solar Energy facility is difficult to assess. While there will be a relatively small number of people employed during the construction and operational phase, the socio-economic benefits associated with the project for the community is significant. With mitigation however, the impact are assessed to be moderate to low.

The developer should inform and converse with interested and affected parties, stakeholders, and affected governance, about the decommissioning of the infrastructure related to the project. This communication needs to be timed well in advance of the decommissioning, allowing all relevant parties to adequately prepare. Lastly, close consideration will be required toward the strategies towards the rehabilitation of the land.

5.6. No-Development Option

The No-Development alternative is the option of not constructing the proposed Solar project. The operation and construction of the project is expected to result in a number of positive and negative impacts. The majority of the negative impacts identified for the project are associated with the construction phase of the project, while the positive impact identified is associated with the operational phase, while still evident in the construction phase.

The positive and negative social impacts identified that will be assessed for the construction phase include:

- » Direct employment opportunities
- » Economic multiplier effects
- » Influx of jobseekers and change in population
- » Safety and security impacts
- » Nuisance impacts, including noise and dust
- » Visual impacts and impacts on the sense of place

The potential positive and negative social impacts that could arise as a result of the operation of the proposed project include the following:

- » Direct employment and skills development opportunities
- » Development of clean, renewable energy infrastructure
- » Visual impact and impact on sense of place

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 particularly, visual impacts and safety and security impacts. The impact is therefore neutral.

- » There would be an opportunity loss in terms of limiting job creation, skills development, community upliftment and associated economic business opportunities for the local economy as identified, constituting a negative impact.
- » There would also be a loss of opportunity to strengthen the grid connection within the municipal area which will have a negative impact on economic growth and development and therefore result in various 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 current socio-economic and policy context, the no-Development option would represent a negative outcome. Further, the employment opportunities associated with the project, as well as the direct and ancillary socio-economic benefits to the region would be forgone.

6. CONCLUSION AND RECOMMENDATIONS

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 a site visit, interview 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 Error! Reference source not found. and Error! Reference source not found. for the potential impacts identified.

Table 6-1: Summary of potential social impacts identified for the detailed design and construction phase of the Quantum 1 Solar PV Energy Facility

Impact	Significance without mitigation/enhancement	Significance with mitigation/enhancement
Positive Impacts		
Direct employment and skills development	Low	Moderate
Economic multiplier effects	Low	Moderate
Negative Impacts		
Safety and security risks	Low	Low
Impacts on Local Services/Resources	Low	Low
Nuisance impact (noise and dust)	Moderate	Low

Table 6-2: Summary of potential social impacts identified for the operation phase of the Quantum 1 Solar PV Energy Facility

Impact	Significance without mitigation/enhancement	Significance with mitigation/enhancement
Positive Impacts		
Direct employment and skills development	Moderate	Moderate
Development of clean, renewable energy infrastructure	Moderate	Moderate
Negative Impacts		
Visual and sense of place impacts	Low	Low

6.1. Key findings and Recommendations

6.1.1. Key Findings

From a social perspective, it is concluded that the proposed project and its associated infrastructure is supported, but that mitigation measures should be implemented and adhered to. Positive and negative

social impacts have been identified. The assessment of the key issues indicated that there are no negative impacts that can be classified as fatal flaws, and which are of such significance that they cannot be successfully mitigated. Positive impacts could be enhanced by implementing appropriate enhancement measures and through careful planning. Based on the social assessment, the following general conclusions and findings 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 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 to a small extent in creating entrepreneurial development, especially if local business could be involved in the provision of general materials and services during the construction and operational phases.
- » Capacity building and skills training among employees is 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 as a whole.

6.1.2. No-development option

Should the project not continue, the negative impacts associated with the project's construction and operation phases will not occur and the status quo will continue. The area will likely remain undeveloped, and the visual impacts associated with the solar facility will not occur. Further, the potential safety and security issues associated with projects and developments will not occur, the same for the influx of job seekers to the area.

The region will however likewise not benefit from the construction of the project. The area will miss out on the opportunities for jobs that the project will create, as well as the indirect economic benefits associated with the construction and operation of the facility. Further, the use of green renewable energy will serve to provide alternative clean energy in the face of the realities of climate change. The project will also serve to stabilise and bolster the struggling power supply in South Africa, which has done untold damage to the economy and society of the region and country.

6.1.3. 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 where possible, 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 possible dust and noise pollution.
- » Safety and security concerns should be taken into account during the planning and construction phases of the proposed project.

6.1.4. Overall Conclusion

The proposed Quantum 1 Solar Energy Facility and associated infrastructure is unlikely to result in permanent damaging social impacts. The Quantum 1 Solar Energy Facility has the potential to result in significant positive cumulative impacts, specifically with regards to the creation of several socio-economic opportunities for the region, which in turn, can result in positive social benefits. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. The cumulative benefits to the local and regional economy through employment and procurement of services are more considerable than that of the Quantum 1 Solar Energy Facility alone. From a social perspective, it is concluded that the proposed project and associated infrastructure is acceptable and should be developed subject to the implementation of the recommended mitigation measures and management actions contained in this report.

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APPENDIX B: KEY STAKEHOLDERS CONTACTED AND MEETING SCHEDULED

A local site visit was undertaken 7th June 2023 to meet with local landowner and other I&AP's as follows:

Cllr Munyai – Ward 30 Councillor.

In a face-to-face conversation with the Cllr, he notes that he would appreciate more information before making any initial comments. He does mention that development is welcome in the area.

R. McKenzie – Owner of McKenzie Butchery and Abattoir.

In a face-to-face conversation with Mr. McKenzie, he noted that the area has grave sites. He noted that the increased traffic in the area would be good news for his business and that an increase in reliable power would be beneficial. He emphasized the importance of protecting the local water table. He notes that he does not have any major complaints at the proposed development.

Gladness Ngsheshi – Local Resident, employee at Quantum Foods

In a telephonic conversation (22 August 2022), it was confirmed that Gladness was a local resident in the area, and a manager at Quantum foods. Gladness was aware of the project, and had no objections or concerns related to the development and operation of the project. Gladness asked whether local residents might benefit from the proposed solar facility. Gladness was added to the project database.

Ntando Cossa – Local Resident

In a telephonic conversation (22 August 2022), it was confirmed that Ntando was a local resident in the area. Ntando was not aware of the project, however, after a description thereof, had no objections or concerns related to the development and operation of the project. Ntando was added to the project database.

Johanna – Local Resident

In a telephonic conversation (22 August 2022), it was confirmed that Johanna was a local resident in the area. Gladness was aware of the project, and had no objections or concerns related to the development and operation of the project.

Ustert Laatzu – Local Resident

In a telephonic conversation (22 August 2022), it was confirmed that Ustert was a local resident in the area. Ustert was aware of the project, and had no objections or concerns related to the development and operation of the project. Ustert asked whether local residents might benefit from the proposed solar facility, and when construction of the site would begin.

Business and Industry:

McKenzie Butchery and Abattoir

African Bucco Canopies

Quantum Foods – Hensnest

Tarlton Supermarket

Lighthouse Centre Stimulation Centre for the Disabled.