DONAWAY
ENVIRONMENTAL

SOCIAL IMPACT ASSESSMENT
Scoping Report

Benya Solar PV Facility & Associated Grid Infrastructure

PROJECT DETAILS

Project title: **Social Impact Assessment Scoping Report –** Benya Solar PV Facility & Associated Grid Infrastructure

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EXECUTIVE SUMMARY

PROJECT BACKGROUND

WKN Windcurrent SA (Pty) Ltd ('the Applicant') is proposing the development of a photovoltaic (PV) solar energy facility (SEF) known as the Benya Solar PV Facility, including associated grid connection infrastructure, located on the Remaining Extent of Farm Portugal No. 198 and Farm Napoleon No. 216 (grid connection), approximately 72km north west of the town of Northam in the Limpopo Province. The proposed project is intended to form part of the Department of Mineral Resources and Energy (DMRE) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme, but the option also exists for other tenders, wheeling or to supply privately.

The REIPPP Programme aims to secure new generation capacity from renewable energy sources, while simultaneously diversifying South Africa's electricity mix. In 2022, a Climate Change Bill was introduced that seeks to enable the alignment of policies that influence South Africa's climate change response, to ensure South Africa's transition to a low-carbon economy and climate-resilient economy, and to enhance the country's ability and capacity over time to reduce greenhouse gas emissions. The Climate Change Bill was then announced on October 24, 2023. Furthermore, as part of the 2023 State of the Nation Address, the Energy Action Plans' one-year progress report was reflected. Objective 3 in the Energy Action Plan still emphasises fast-tracking the procurement of new generation capacity from renewables, gas and battery storage. South Africa is also responsible for fulfilling its commitments under the United Nations Framework Convention on Climate Change and its Paris Agreement, which include the reduction of greenhouse gas emissions. Eskom, our largest greenhouse gas emitter, has committed in principle to net-zero emissions by 2050 and to increase its renewable capacity.

The proposed development of the Benya Solar PV Facility and associated infrastructure (including grid connection infrastructure) requires Environmental Authorisation (EA) from the National Department of Forestry, Fisheries and the Environment (DFFE) in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), and the 2019 Environmental Impact Assessment (EIA) Regulations (GNR 324, 325 and 327).

The Social Impact Assessment (SIA) Report has been prepared by Donaway Environmental on behalf of WKN Windcurrent SA (Pty) Ltd. It is intended to provide input into the EIA report to be submitted to DFFE.

KEY FINDINGS AND RECOMMENDATIONS

Key Findings

The SIA has assessed the development of the Benya Solar PV Facility and grid connection infrastructure project, located on the Remaining Extent of Farm Portugal No. 198 and Farm Napoleon No. 216, approximately 72km north west of the town of Northam in the Limpopo Province. Several positive and negative social impacts have been identified for the project.

Dwaalboom/Northam and surrounding communities can be considered as vulnerable towards the social impacts as they are in close proximity to the site and most likely to be impacted by the

associated impacts of the proposed development of the Benya Solar PV Facility and grid connection infrastructure. The construction phase is traditionally associated with the greatest social impact on communities, with residents and businesses in Dwaalboom/Brits and its surrounding communities most likely affected. Many of the social impacts are unavoidable and will take place to some extent, but can be managed through the careful planning and implementation of appropriate mitigation measures.

Based on the social impact assessment, the following general conclusions and findings can be made:

- The construction phase of the Benya Solar PV Facility and grid connection infrastructure, like any other construction project, may bring about negative social impacts, such as the influx of non-local workers and job seekers, disturbance due to noise and dust pollution, increase in road usage which could lead to road damage, and safety concerns in the region. The impacts are not limited to PV and grid projects but are rather common in most construction projects. These impacts can be reduced by implementing proposed mitigation measures. Therefore, taking proactive measures to minimise the significance of these impacts on Dwaalboom/Northam and the surrounding communities.
- The proposed Benya Solar PV Facility and associated grid connection infrastructure will introduce visual intrusion into the surrounding regions of the project. Although it will be screened by the vegetation cover in the region and therefore not affect nearby communities as much.
- The development of the Benya Solar PV Facility and grid connection infrastructure will generate employment opportunities for individuals from the Dwaalboom/Northam and surrounding communities. Specifically, this would benefit the Thabazimbi LM as a large proportion of the population is not economically active (34.4%) or is unemployed (13.1%).
- The implementation of the Benya Solar PV Facility is expected to enhance skill development in the community and lead to better employment opportunities. This, in turn, will equip the workers with valuable knowledge and skills that can be beneficial for their future professional endeavours.
- The Thabazimbi LM's economy has the potential to benefit from the proposed project by fostering entrepreneurial growth and opportunities, particularly for local businesses in Dwaalboom/Northam. These businesses, involved in the provision of general materials, goods, and services during both the construction and operational phases, are likely to experience positive impacts. Furthermore, the cumulative effects of developing additional solar facilities to the currently proposed facilities could amplify these benefits.
- The proposed development of the Benya Solar PV Facility represents an investment in non-polluting and renewable energy infrastructure. In comparison to energy generated through the combustion of fossil fuels, this presents a favourable social benefit for society.
- Some of the surrounding landowners have raised their concerns regarding the project. They are concerned about the change in the sense of place, ecological impacts and safety and security during the construction phase. One business in the area is concerned about the impact that might be associated with a change in aesthetics in the area.

Recommendations

The following recommendations are made based on the SIA. The proposed mitigation measures should be implemented to limit the negative impacts and enhance the positive impacts associated with the project. Based on the social assessment, the following recommendations are made:

- The appointment of a Community Liaison Officer (CLO) to assist with the management of social impacts and to deal with community issues, if feasible.
- It is imperative that local labour be sourced, wherever possible, to ensure that benefits accrue to the local communities. Efforts should be made to involve local businesses during the construction activities, where possible. Local procurement of labour and services/products would greatly benefit the community during the construction and operational phases of the project.
- Local procurement of services and equipment is required where possible to enhance the multiplier effect.
- Involve the community in the process as far as possible (encourage cooperative decision-making and partnerships with local entrepreneurs). In particular, the community needs to be involved during the public participation process of the EIA, whereby their comments are relevant, feasible, practical and of concern, should be addressed.
- Employ mitigation measures to minimise dust and noise pollution and damage to existing roads. In particular, the project should be subject to adherence to the National Environmental Management: Air Quality Act (Act No 39 of 2004) and measures in respect of dust control. Employing the National Dust Control Regulations of November 2013 during the construction phase will limit gaseous or particulate emissions as anticipated from exhaust emissions from construction vehicles and equipment on-site, as well as vehicle-entrained dust from the movement of vehicles on the internal access roads.
- National noise control regulations & SANS 10103:2008: the Measurement and Rating of Environmental Noise should be implemented to reduce the overall noise impact.
- Construction activities will ensure that damage to public roads and access roads attributable to construction vehicles is repaired prior to the completion of the construction phase.
- Safety and security risks should be considered during the construction phase of the proposed project. Access control, security, and management should be implemented to limit the risk of crime increasing in the area. In particular, the scoping phase of the EIA should identify possible safety and security risks associated with the proposed development to be implemented prior to the construction phase.

NEED FOR A SOCIAL IMPACT ASSESSMENT

A social impact assessment is essential for a solar energy facility for several reasons. First, it helps ensure that the well-being of local communities is considered. Solar projects can significantly affect the surrounding areas, influencing employment opportunities, infrastructure, and the quality of life. The SIA provides a thorough understanding of how the project will impact the community, allowing for the consideration of local needs and concerns before construction begins.

Additionally, solar facilities often require large areas of land, which may affect agricultural use, local ecosystems, or even wildlife habitats. The SIA evaluates the social consequences of such land use changes, addressing how these transformations could impact people who rely on the land for their

livelihoods. This assessment is crucial in minimising adverse effects on land users and surrounding communities.

The potential health and safety risks associated with the construction and operation of a solar facility are another reason for conducting an SIA. These projects can introduce environmental or safety hazards, which could have long-term implications for the local population. An SIA helps identify these risks and ensure that proper measures are in place to protect public health and safety.

The economic impact of a solar facility is another critical factor that the SIA addresses. Solar projects often bring new job opportunities, but it's important to assess whether these jobs will benefit local residents or if a significant portion of the workforce will come from outside the area. The SIA helps gauge the economic benefits to the local community, ensuring that the project aligns with the area's economic needs. In sum, an SIA will ensure that the benefits of the solar facility are maximized, while minimizing any negative social impacts, leading to more sustainable and harmonious development.

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LIST OF ACRONYMS

AC	Alternating Current
BA	Basic Assessment
BAR	Basic Assessment Report
B-BBEE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
BESS	Battery Energy Storage System
CA	Competent Authority
CLO	Community Liaison Officer
CNA	Community Needs Assessment
CPA	Communal Property Association
CSP	Concentrated Solar Power
DC	Direct Current
DEA	Department of Environmental Affairs (National)
DEAT	Department of Environmental Affairs and Tourism
DFFE	Department of Environment Forestry and Fisheries
DMRE	Department of Mineral Resources and Energy
DM	District Municipality
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (No. 73 of 1989)
ECO	Environmental Control Officer
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
EP	Equator Principles

EPC	Engineering, Procurement and Construction
FMP	Fire Management Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
IRP	Integrated Resource Plan
GIS	Geographic Information System
ha	Hectare
km	Kilometre
kV	Kilovolt
LED	Local Economic Development
LM	Local Municipality
LRP	Livelihood Restoration Plan
MW	Megawatt
NDP	National Development Plan
NEPCO	National Electrical Power Company
NERSA	National Energy Regulator of South Africa
NEMA	National Environmental Management Act (No. 107 of 1998)
O&M	Operations and Maintenance
OHS	Occupational Health and Safety
PSDF	Provincial Spatial Development Framework
PV	Photovoltaic
RAP	Resettlement Action Plan
RE	Renewable Energy
REDZ	Renewable Energy Development Zone

REIPPP	Renewable Energy Independent Power Producer Procurement Programme
SDF	Spatial Development Framework
SEF	Solar Energy Facility
SIA	Social Impact Assessment
ToR	Terms of Reference
UNESCO	United Nations Educational, Scientific and Cultural Organisation

1. INTRODUCTION

1.1. Project Background

WKN Windcurrent SA (Pty) Ltd ('the Applicant') is proposing the development of a photovoltaic (PV) solar energy facility (SEF) known as the Benya Solar PV Facility, including associated grid connection infrastructure, located on the Remaining Extent of Farm Portugal No. 198 and Farm Napoleon No. 216 (grid connection), approximately 72km north west of the town of Northam in the Limpopo Province. The proposed project is intended to form part of the Department of Mineral Resources and Energy (DMRE) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme, but the option also exists for other tenders, wheeling or to supply privately.

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1.2. Project Location

The proposed Benya Solar PV Facility and associated grid connection infrastructure is located approximately 72km north west of the town of Northam, situated within the Thabazimbi Local Municipality (LM) within the Waterberg District Municipality (DM) of the Limpopo Province. The site is accessible via the existing D113 or D1629 district roads. Please refer to **Figure 1.1** (Locality) and **Figure 1.2** (Layout) below.

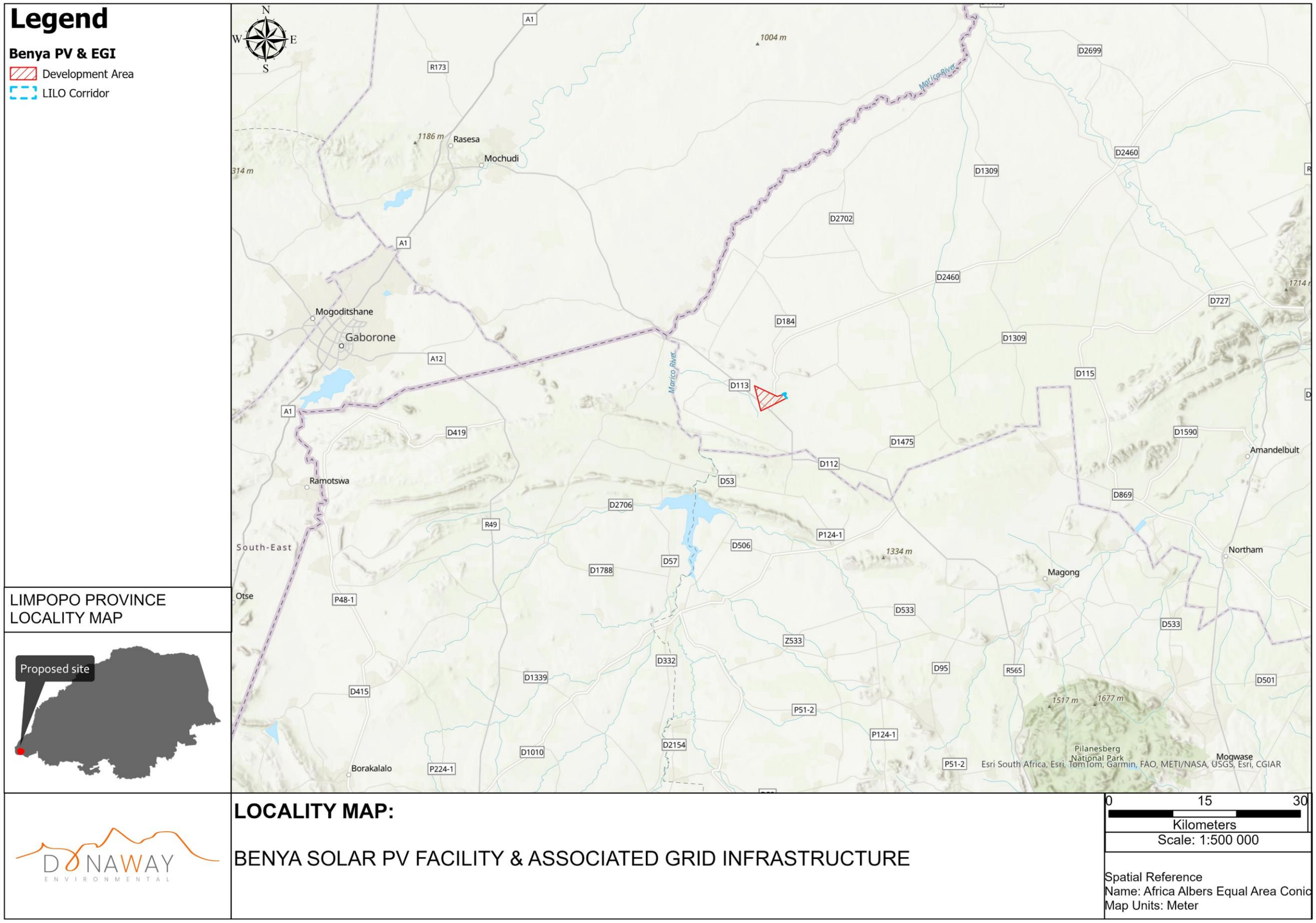

Figure 1.1: Locality map for the proposed Benya Solar PV Facility near Northam, Limpopo Province

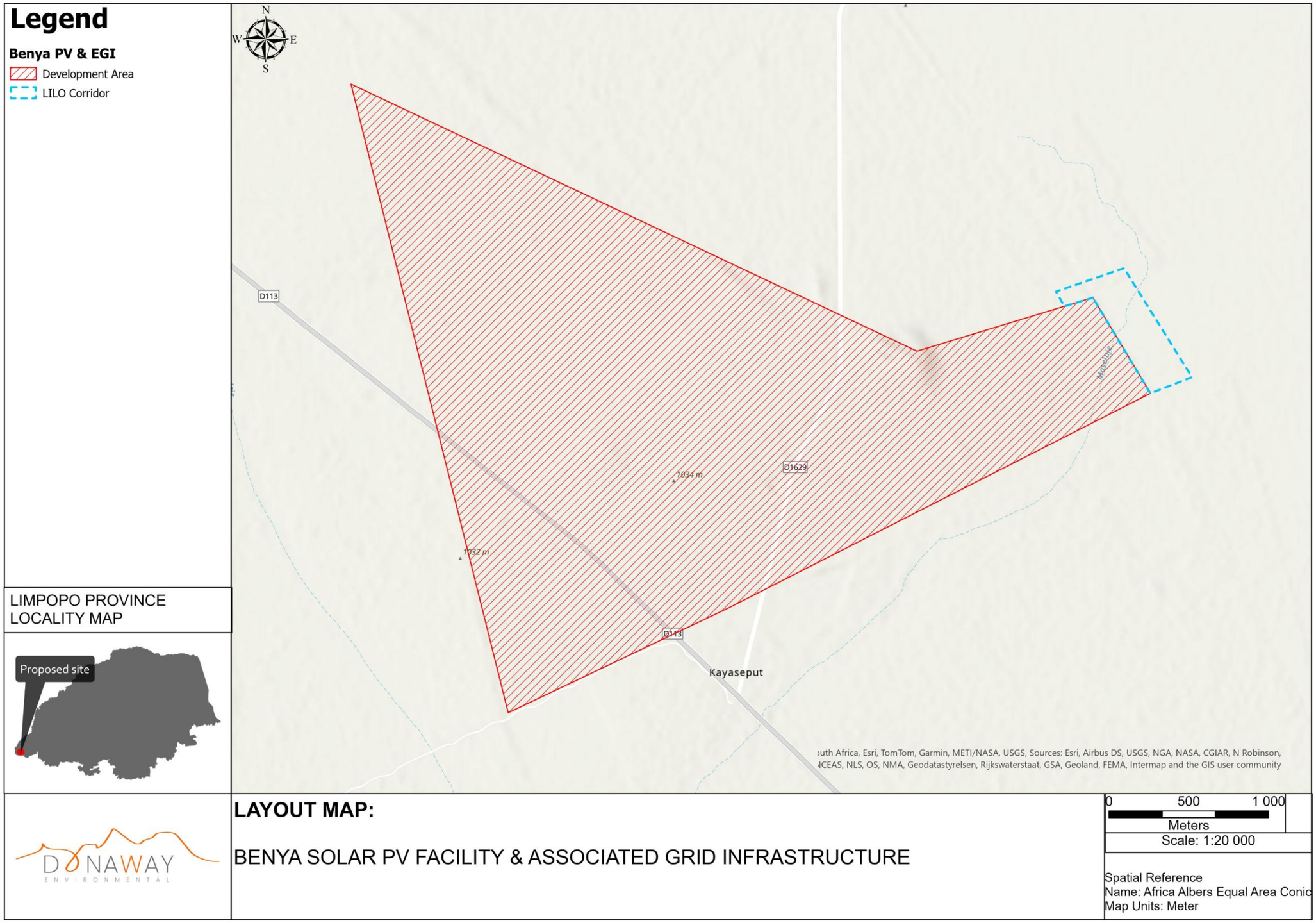

Figure 1.2: Layout map for the proposed Benya Solar PV Facility near Northam, Limpopo Province

1.3. Project Description and Technical Details

The applicant, WKN Windcurrent SA (Pty) Ltd, is proposing the construction and operation of an up to 500MW Solar Photovoltaic (PV) Development and associated infrastructure, including associated Electrical Grid Infrastructure (Powerline and Substation). The key infrastructure associated with the Benya Solar PV Development includes:

- PV modules and mounting structures.
- Inverters and transformers.
- Operation and Maintenance buildings, including a gate house, ablution facilities, security building, control centre, offices, warehouses and workshops for storage and maintenance.
- Temporary and permanent laydown areas, situated within the assessed footprint.
    - Temporary laydown areas will occupy up to 10 ha, while 1 ha will remain in place for the permanent laydown area, as required for facility operation.
- Site and internal access roads. Existing internal roads will be used as far as possible.
- Perimeter fencing.
- Battery Energy Storage System (BESS). The infrastructure will be located within the assessed development footprint.
- Associated Electrical Grid Connection Infrastructure, including:
    - 33kV cabling between the project components and the on-site facility substation.
    - A 33kV/132kV Independent Power Producer (IPP) Step-up Substation.
    - A 132kV Eskom Switching Substation.
    - A 132kV overhead powerline connecting the on-site switching substation to one of the nearby 132kV Eskom overhead powerlines, via a Loop In – Loop Out (LILO) connection. A 300m corridor is being proposed to allow flexibility while routing powerline.

The details of the location of the Benya Solar PV and associated infrastructure are included in **Table 1.1** below.

Table 1.1: General site and location information

Description of affected farm portions	<u>SEF</u> • Remaining Extent of Farm Portugal No. 198 KP (T0KP00000000019800000) <u>Electrical Grid Infrastructure:</u> • Farm Napoleon No 216 KP (T0KP00000000021600000)
Province	Limpopo Province
Local Municipality (LM)	Thabazimbi LM
District Municipality (DM)	Waterberg DM
Ward numbers	Ward 1
Closest towns	The town of Dwaalboom is approximately 22 km east of the proposed development, while the larger town of Northam is

	located approximately 72km south-east of the proposed development
Area under assessment (Development Area)	863 ha (excluding linear components)
Type of technology	Photovoltaic (PV) solar facility
Generation capacity	Up to 500 MW
Area of the PV Array	To be confirmed once the development footprint is available. Will be located within the 863 ha development area
Structure Height	• PV Panels and mounting structures up to 8 m • Power line up to 40 m
Area of the facility substation and switching station	• On-Site Facility IPP step-up Substation: 1.5 ha • Eskom Switching Substation: 1.5 ha
Capacity of the facility substation and switching station	• On-Site Facility IPP step-up Substation: 33/132kV • Eskom Switching Substation: 132kV
Grid connection	Loop In- Loop Out Powerline with 300m corridor (to allow flexibility while routing powerline)
Laydown area dimensions	• Temporary laydown areas will occupy up to 10 ha. • 1 ha will remain in place for the permanent laydown area, as required for facility operation
Area occupied by buildings	Permanent auxiliary building will occupy an area of up to approximately 10 ha, which will include a gate house, ablution facilities, security building, control centre, offices, warehouses and workshops for storage and maintenance
Width of access roads	Up to 8 m wide
Width of internal roads	Up to 6 m wide

The development footprint will be defined based on the outcomes of the scoping phase (and results of the independent specialists) and will be further assessed in the EIA phase, which will include the assessment of a detailed facility layout.

1.4. Consideration of Alternatives

This section describes the alternatives under consideration for the Benya Solar PV Facility. In terms of the Regulations, only 'feasible' and 'reasonable' alternatives should be considered for development. The process undertaken by the Applicant for the identification of alternatives has been an iterative process and will continue to be an iterative process between the Environmental Assessment Practitioner (EAP) and the Applicant in order to ensure that the preferred alternative proposed for

authorisation is ultimately appropriate from a technical feasibility perspective as well as an environment perspective. Refer to **Table 1.2** for an overview of the alternatives being considered.

Table 1.2: Summary of the alternatives considered

Alternatives considered	Description of the Alternative relating to the development
Site Specific and Layout Alternatives	No site alternatives have been considered, as the project site was chosen due to its suitable climatic conditions, topography (i.e., in terms of slope), environmental conditions (i.e., low agricultural potential, ecological sensitivity and archaeology), proximity to the existing Eskom grid connection infrastructure, and proximity to existing roads (i.e., to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase). No layout alternatives are being considered as the best possible layout for the PV facility will be put forward and will be informed by both environmental and technical considerations.
Activity Alternatives	Only the development of a renewable energy facility is considered by WKN Windcurrent SA (Pty) Ltd. Due to the location of the site/development area and the suitability of the solar resource, only the development of a solar PV facility is considered feasible, considering the natural resources available to the area and the current land-use activities undertaken within the site (i.e., agricultural activities).
Technology Alternatives	Only the development of a photovoltaic (PV) solar facility is considered due to the characteristics of the site, including the natural resources available.
Grid Connection Alternatives	No alternative connection points have been identified at this stage.
'Do-nothing'/'No-Go' Alternative	The option to not construct the Benya Solar PV Facility. No impacts (positive or negative) are expected to occur on the social and environmental sensitive features or aspects located within the surrounding areas of the site. The opportunities associated with the development of the solar facility for the surroundings area will however not be realised.

1.5. Terms of Reference

The primary aim of this SIA study is to identify, describe, and evaluate the potential social impacts that may result from the proposed solar facility development. The Terms of Reference (ToR) for this SIA outline the following requirements:

- **Description of the surrounding environment**: Provide an overview of the environment in the area where the proposed solar facility will be developed, highlighting key natural, ecological, and human features. Include an assessment of how this environment may be impacted by the development and associated activities.
- **Assessment of potential social impacts:** Outline and evaluate the social impacts that could arise from the proposed solar facility development.
- **Enhancement and mitigation measures:** Identify strategies to maximise positive opportunities and minimise or avoid negative effects related to the solar energy facility development. These measures should focus on promoting sustainable development while addressing any adverse outcomes effectively.

In addition to the primary aim of this SIA study, specialists' reports must comply with Appendix 6 of GNR982(South Africa: DEA, 2017) published under section 24(5), and 44 of the National Environmental Management Act, 1988 (Act No. 107 of 1998)(South Africa: DEA, 1998), as amended, and whereby the following is stated in **Table 1.3** are to be included. The results of these specialist studies will be integrated into the EIA for comments and final submissions to all Interested and Affected Parties (I&APs) and DFFE.

Table 1.3: Appendix 6 of GNR326 – Report sections

Requirements of Appendix 6 – GN R982 EIA Regulations of 7 April 2017	Relevant section in report
The details of the specialist who prepared the report and the expertise of that specialist to compile a specialist report including a curriculum vitae.	Section 1.8 Annexure 1: Curriculum Vitae
A declaration that the specialist is independent in a form as may be specified by the competent authority.	A separate Declaration of Independence is commissioned for each project and sent to the Environmental Assessment Practitioner.
An indication of the scope of, and the purpose for which, the report was prepared.	Section 2.2 Section 7
The date and season of the site investigation and the relevance of the season to the outcome of the assessment.	Section 2.4. The season is not applicable for a Social Impact Assessment.
A description of the methodology adopted in preparing the report or carrying out the specialised process; the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure.	Section 2.3 and 2.4
An identification of any areas to be avoided, including buffers.	This will be reflected in Section 9 if applicable.
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.	Section 1.

Requirements of Appendix 6 – GN R982 EIA Regulations of 7 April 2017	Relevant section in report
A description of any assumptions made and any uncertainties or gaps in knowledge.	Section 2.5
A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment.	Section 8 and Section 9
Any mitigation measures for inclusion in the EMPr.	Section 8
Any conditions for inclusion in the environmental authorisation.	Section 8
Any monitoring requirements for inclusion in the EMPr or environmental authorisation.	Section 8
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised, and if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan.	Section 9
A description of any consultation process that was undertaken during preparing the specialist report.	Section 2.4.2 and Section 5. Public Participation Process is undertaken as part of the Environmental Impact Assessment (EIA) / Basic Assessment (BA) executed by the Environmental Assessment Practitioner (EAP).
A summary and copies of any comments received during any consultation process and where applicable all responses thereto.	Table 5.1 and 5.2. Public Participation Process is undertaken as part of the Environmental Impact Assessment (EIA) / Basic Assessment (BA) executed by the Environmental Assessment Practitioner (EAP).
Any other information requested by the competent authority.	N/A

In addition to the above, specialists are expected to:

- Review the Scoping Report/Environmental Impact Report (EIR), with specific reference to the Comments and Response Report, to familiarise with all relevant issues or concerns relevant to their field of expertise.
- In addition to the impacts listed in the EIR, identify any issue or aspect that needs to be assessed and provide expert opinion on any issue in their field of expertise that they deem necessary to avoid potential detrimental impacts.

- Assess the degree and extent of all identified impacts (including cumulative impacts) that the preferred project activity and its proposed alternatives, including that of the no-go alternative, may have.
- Identify and list all legislation and permit requirements that are relevant to the development proposal in the context of the study.
- Reference all sources of information and literature consulted; and
- Include an executive summary of the report.

1.6. International Finance Corporation Performance Standard 1

The International Finance Corporation (IFC) Standard 1 forms the foundation for conducting a Social Impact Assessment as part of the broader Environmental and Social Impact Assessment. **Table 1.4** presents how the standard is incorporated within this report

Table 1.4: IFC Performance Standard 1

IFC Standard 1 Principle	The relevant section in the report
Framework for Risk Identification and Assessment. • Baseline social conditions • Impact analysis • Human rights and vulnerabilities	Section 4 Section 7 Section 8 Section 2
Stakeholder Engagement. • Identifying stakeholders • Consultation process • Disclosure and participation	Section 2.4.2 Table 5.1 Table 5.2
Application of the Mitigation Hierarchy • Avoid • Minimise • Restore	Section 7 Section 8
Development of Social Management Plans • Resettlement Action Plans • Community Health and Safety Plans • Livelihood Restoration Plans • Grievance Mechanisms	Section 6
Monitoring and Adaptive Management • Indicators • Stakeholder feedback • Adaptive management	Section 6 Table 5.1 Table 5.2
Reporting and Disclosure • Baseline social conditions • Predicted social impacts • Mitigation measures	Incorporated throughout report.

IFC Standard 1 Principle	The relevant section in the report
• Engagement and consultation activities with stakeholders • Monitoring plans and grievance mechanisms	
Alignment with Other IFC Performance Standards • Performance Standard 2: Labor and Working Conditions. • Performance Standard 4: Community Health, Safety, and Security. • Performance Standard 5: Land Acquisition and Involuntary Resettlement. • Performance Standard 7: Indigenous Peoples.	Incorporated throughout report.

1.7. Project Team and Experience

The SIA was undertaken by Johan Botha and Michael Cloete (detailed CVs attached in **ANNEXURE 1: CURRICULUM VITAE**).

Johan Botha graduated with an Honours degree in 2011 from the North West University in the field of Environmental Sciences specialising in Geography and Environmental Management and has since been involved in the environmental management of substations, powerlines and solar PV plants together with over 150+ Visual Impact Assessments (VIA) and 70+ Social Impact Assessments (SIA), mostly in the field of Renewable Energy. All the above-mentioned experience accumulated the necessary skills to conduct visual and social impact assessments.

Michael Cloete graduated with a Master's degree in 2020 from the North West University in Geography and Environmental Management with a focus on Geographic Information Systems (GIS) and Visual Impact Assessment (VIA). He has since been involved in 70+ Social Impact Assessments and 30+ Visual Impact Assessments, mostly within the renewable energy sector. The accumulated knowledge and continuous learning environment have provided him with the required knowledge and experience to conduct social and visual impact assessments.

2. METHODOLOGY

2.1. Literature Review

The term “Social Impact Assessment” refers to the efforts to analyse, monitor and manage, in advance, the unintended and intended social consequences, positive or negative, which are likely to follow from proposed interventions, policies and/or programmes(International Association for Impact Assessment, 2003)(Vanclay, 2006). The objective of an SIA is to identify the intended as well as the unintended effects of planned interventions to achieve sustainable development(Hildebrandt and Sandham, 2014). Esteves and Vanclay(Esteves and Vanclay, 2009) and Hildebrandt goes further by stating that SIA should be seen as an umbrella assessment, which incorporates the evaluation of all impacts on people and on all the ways in which people interact with their socio-cultural, biophysical, and economic surroundings.

Vanclay (Vanclay, 2003) described social change processes as a very discreet, describable, and observable process, which changes the characteristics of a society. These processes are set in motion by different project interventions and or development policies. If these changes are managed effectively, they may not create impacts, but depending on the context, these social change processes might lead to a social impact on a community. Examples of such social processes include the increase in population, the influx of temporary workers, the relocation of communities etc. According to Vanclay the term “social impacts” can be defined as “the consequences to human populations of any public or private actions (these include policies, programmes, plans and/or projects) that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally live and cope as members of society. These impacts are felt at various levels, including individual level, family or household level, community, organisation or society level. Some social impacts are felt by the body as a physical reality, while other social impacts are perceptual or emotional”. It is important to note that social impacts can vary in both space and time. Social impacts can also differ in the way people differ from gender, culture, religion, ethnicity and in general how they view the world. This is better known as the social construct of reality and refers to people’s worldviews and the way they react to impacts and changes.

Understanding social impacts includes the identification of stakeholders that may be impacted by the intervention. Stakeholders are defined as: “Any group or organisation which may affect or be affected by the issue under consideration(United Nations: Department of Economic and Social Affairs, 2006)”.

These groups may be directly or indirectly impacted and can include organisations, institutions, communities, or individuals. Any position in society can be impacted, from international, national, regional, household levels etc (Guidero and Franke, 2012) .

Stakeholder analysis involves the identification of affected or impacted people and their key grouping and sub-groupings. Identifying stakeholders that are directly and indirectly affected by the project is important to determine who might be impacted by the development and in what way. The key stakeholders in the proposed project have been identified, grouped/sub-grouped and described as per Ilse Aucamp’s SIA methodology(Aucamp *et al.*, 2011). There are immediate, direct, and indirect areas of influence on the proposed development. Affected stakeholders comprise sensitive social receptors that may potentially be affected by the proposed development based on their location.

2.2. Purpose of the Study

Social Impact Assessments are defined by International Principles (International Finance Corporation (IFC), 2007) 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 can 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 well-being – 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 Report 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) because 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.

2.3. Review of Methodological Approaches within Social Impact Assessment

The Guidelines for Involving Social Impact Assessment Specialists in the EIA process that were prepared for the Department of Environmental Affairs and Development Planning for the Western Cape Province of South Africa in February 2007 include guidelines and key components that should be incorporated within a SIA study (Barbour, 2007). These are based on international best practice guidelines. The key components of the SIA process which are embodied in these guidelines include:

- Describe and obtain a basic understanding of the proposed development (type, scale and location). Also, obtain an understanding of the individuals and/or communities which are

likely to be affected by the intervention, and determine the need and the scope of conducting an SIA;
- Collecting the baseline data for the proposed intervention based on the current social environment and historical social trends;
- Assess and document the significance of the social impacts which are associated with the proposed development; and
- Based on the baseline data and the identification and assessment of the social impacts likely to be associated with the proposed intervention, identify alternatives and mitigation measures for the social impacts of the proposed intervention (Barbour, 2007)

The second approach identified was based on the literature of Vanclay. Vanclay research study made use of a qualitative research approach. A qualitative research approach answers questions about the complex nature of a phenomenon. The aim of this approach is to describe and understand the phenomenon from a participant's point of view. This research approach mainly relies on converting information from observations, reports, and recordings into data and then into the written word.

2.4. Methodological Approaches

This Social Impact Assessment study follows a research approach based on the Guideline for Involving Social Impact Assessment Specialists in the EIA Process, with the additional inclusion of the approach mentioned by Vanclay. The steps involved in this study are included below:

- 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 WKN Windcurrent SA (Pty) Ltd and the Environmental Consultant (Cape Environmental Assessment Practitioners (Pty) Ltd).
- Collection of primary data. Telephone interviews will be conducted with directly affected landowners and key stakeholders, e.g., business owners located in the surrounding town, to gain their input on the project and its perceived social impacts and benefits on the affected community. The interviews will follow a semi-structured interview to obtain their respective views on the proposed development.
- Identification of potential direct, indirect, and cumulative impacts likely to be associated with the construction, operation, and decommissioning of the proposed project.
- Where applicable mitigation measures with which to minimise impacts and enhance benefits associated with the project were identified.
- Preparation of an SIA Report and inputs into the Environmental Management Programme (EMPr) to be prepared for the project.

Each step of the SIA approach used within this study is discussed in the following sections below:

2.4.1. Collection and Review of Existing Information

Existing desktop information which has relevance to the proposed project, project site, and surrounds was collected and reviewed. The following sources of information were examined as part of this process:

- Project maps and layouts.

- Google Earth and Google Maps imagery.
- A description of the project (as provided by the project proponent).
- Information regarding employment, social upliftment, and local economic development opportunities (as provided by the project applicant).
- Census data (2011 and 2022), Community Survey (2016) and the Local Government Handbook (2018).
- Africa 2021, South African Police Service official crime statistics report.
- Planning documentation such as Provincial Growth and Development Strategies (PGDSs), LM and DM.
- 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 PVs and associated infrastructure.

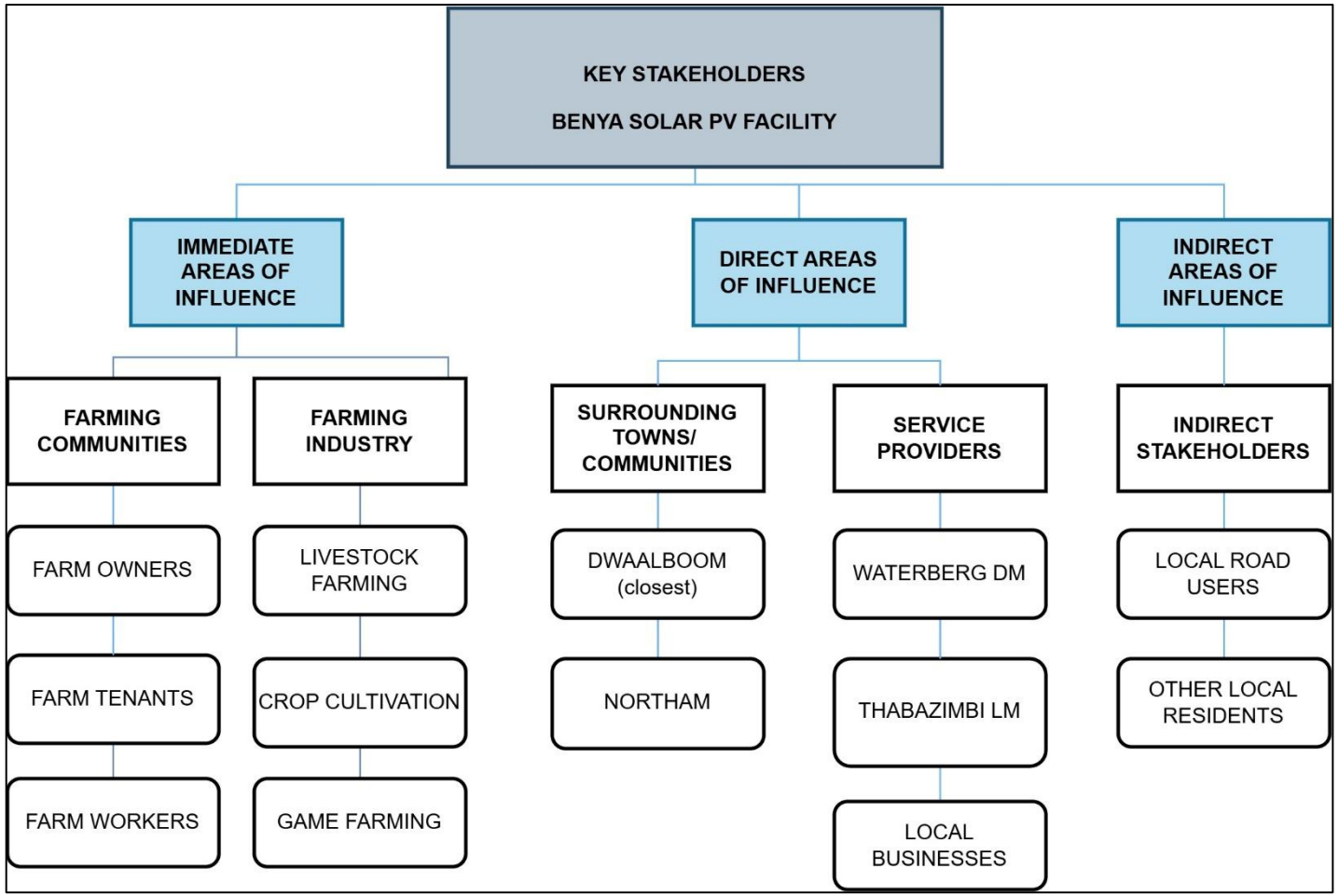

Figure 2.1: Key Stakeholders of the proposed Benya Solar PV Facility

A description of each stakeholder group in relation to the Benya Solar PV Facility is discussed below:

- **Farming Community**: The farming community can be grouped into three categories, namely farm owners, farm tenants, and farm workers. Farm owners comprise individuals who own the property and, in most cases, make a living off their properties. Farm tenants are people who rent land and work on the land to earn an income. Farm workers are people who work, and often reside on the farm with their families and are seen as a vulnerable community. These communities are seen as vulnerable as they are most likely to be associated with the impacts involved with the proposed development, additionally, their way of life may be affected by the proposed development in terms of the associated impacts on their daily routine or safety. Impacts that may arise for the farming community include impacts on (and the potential loss of) agricultural land and infrastructure, potential nuisance impacts (as a result of dust and noise specifically during construction), safety and security impacts (as a result of an in-migration of people in search of employment opportunities), impacts on the area's sense of place (as a result of a change in land use), visual impacts (as a result of construction equipment and activities and the presence of the PV and grid connection infrastructure), cultural and social changes (also as a result of an in-migration of people in search of employment opportunities and a change in land use), and additional traffic and road safety impacts (as a result of the movement of construction equipment and personnel).

- **Farming industry:** The primary agricultural activity in the study area is livestock farming, with game farming and crop cultivation practices in the surrounding region. Impacts that may arise as a result of the project include stock theft and poaching from an increase of people in the area (especially during the construction phase), impacts on current farming practices such as dust impacts which could affect grazing areas (especially during the construction phase), and potential loss of agricultural land as a result of the direct occupation of the land by the proposed facility and its associated infrastructure, which would remove the development footprint from agricultural production reducing the overall livestock capacity in the region increasing a threat to food security. Noise and movement of people may also negatively impact farming operations.

- **Surrounding towns / affected communities:** The closest town to the proposed project is Dwaalboom, located approximately 22km east of the proposed development, while the larger town of Northam is located approximately 72km south-east. Residents within Dwaalboom/Northam, local communities, and the surrounding area may be positively and/or negatively impacted by the proposed development. Employment opportunities will become available as a result of the construction and operation of the proposed development, and it is probable that a portion of the labour force required for the project will be sourced from (and accommodated within) Dwaalboom/Northam and surrounding towns/communities, which will present a positive impact for the local community. In addition, contributions to the Social Development of the local communities in terms of the DFFE's requirements under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) will result in local upliftment and positive impacts. In the case of the project not forming part of the REIPPP Programme, social upliftment will still occur in the region due to employment opportunities being created within the community.

- **Service providers:** Major service providers that will be affected by the project include the Waterberg DM, Thabazimbi LM, and local businesses in the area. The Waterberg DM and the Thabazimbi LM are likely to be impacted by the proposed development. The Thabazimbi LM is a Category B municipality, meaning that it shares municipal executive and legislative authority in the area with the Waterberg DM. The Thabazimbi LM will absorb a number of positive and negative social impacts in the form of employment creation, increased local expenditure, increased revenue, etc., as well as potential negative impacts in the form of an in-migration of people and increased pressure being placed on local services. Local businesses within the area could benefit from the proposed project in terms of an increase in demand for goods and services associated with the project.

- **Stakeholders outside the direct area of influence:** There are a number of stakeholders that reside outside the direct area of influence but who may also be impacted by the project. These include road users who utilise the D113 or D1629 district roads and other local gravel roads adjacent to the site, on a frequent basis, as part of their daily or weekly movement patterns. Construction vehicles and trucks will utilise these roads during construction, which will result in increased traffic, which may create traffic disruptions, and which may increase the wear and tear on these roads.

2.5. Assumptions and Limitations

This section of the report briefly describes the assumptions and limitations of this SIA study.

2.5.1. Assumptions

- It is assumed that the proposed site is technically appropriate for the development of a Solar Energy Facility, with feasibility studies conducted in an ethical and rigorous manner, providing an accurate reflection of the site's suitability for the project.
- It is assumed that all information supplied by the independent Environmental Assessment Practitioner was accurate and true.
- It is assumed that the information obtained during the public participation process accurately represents the community's perspectives on the proposed development and that this feedback was recorded faithfully.
- It is assumed that promoting renewable energy sources is of strategic importance, as confirmed by the national and provincial policies discussed in Section 3 of this report.
- Legislation and policies reflect societal norms and values.
- National and provincial policies discussed in Section 3 of this report reflect societal norms and values. The context of these policies, therefore, forms an important part of identifying and assessing the potential social impacts associated with the proposed development. It is regarded as a key component of the SIA process to assess the proposed development in terms of its fit with key planning and policy documents. As such, should the findings of the study indicate that the proposed development in its current format does not conform to the spatial principles and guidelines contained in the relevant legislation and planning documents and that there are no significant or unique opportunities created by the proposed solar farm, the development of a SEF at the proposed site cannot be supported.

2.5.2. Limitations

- Data available within the 2011 Census, Community Survey 2016, 2022 Census, the Local Government Handbook South Africa 2021, South African Police Service official crime statistics reports, the Limpopo Development Plan (LDP) 2020 – 2025, Limpopo Provincial Spatial Development Framework (2024), Waterberg District Municipality Integrated Development Plan 2024/25, Waterberg District Municipality Spatial Development Framework First Draft 2021, Thabazimbi Local Municipality Integrated Development Plan 2024/2024 and the Thabazimbi Local Municipality Spatial Development Framework 2022 was used to generate most information provided in the baseline profile of the study area. The possibility 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 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. Additional information available from the public participation undertaken during the Scoping Phase will be included within the final EIA report, where relevant.
- Some of the project projections reflected in this SIA Report (i.e., with regard to job creation and local content) are based on information currently available and may be subject to change, and therefore may be higher or lower than those estimated by the project proponent.

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 Renewable Energy of (2003)
- The National Energy Act no 34 of (2008)
- Integrated Energy Plan (IEP) (2016)
- Integrated Resource Planning for Electricity for South Africa of 2010-2030 (2019)
- Integrated Resource Plan (2024) (Draft)
- National Development Plan (NDP) of 2030 (2012)
- National Infrastructure Plan of South Africa (2012)
- National Climate Change Response Policy Paper (2011)
- Strategic Infrastructure Projects (SIPs)
- New Growth Path Framework (2010)
- 2021 State of the Nation Address

Provincial Policy and Planning Context:

- Limpopo Development Plan (LDP) 2020 – 2025
- Limpopo Provincial Spatial Development Framework (2024)

District Level Policy and Planning Context:

- Waterberg District Municipality Integrated Development Plan 2024/25
- Waterberg District Municipality Spatial Development Framework First Draft 2021

Local Level Policy and Planning Context:

- Thabazimbi Local Municipality Integrated Development Plan 2024/2024
- Thabazimbi Local Municipality Spatial Development Framework 2022

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 existing national policy environment on 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 below.

3.1.1. Constitution of the Republic of South Africa (1996)

The Constitution of the Republic of South Africa (South Africa, 1996) is the Supreme law of South Africa and forms the foundation for a democratic society in which fundamental human rights are protected. The Bill of Rights contained in Chapter 2 of the Constitution enshrines the rights of all people in South Africa and affirms the democratic values of human dignity, equality, and freedom. Section 24 of the Constitution pertains specifically to the environment. It states that:

24. Everyone has the right –

(a) To an environment that is not harmful to their health or well-being, and

(b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

(i) Prevent pollution and ecological degradation.

(ii) Promote conservation.

(iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

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

3.1.2. National Environmental Management Act (No. 107 of 1998) (NEMA)

The National Environmental Management Act (No. 107 of 1998) (South Africa, 1998) (NEMA) is South Africa's key piece of environmental legislation and sets the framework for environmental management in South Africa. It provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment. 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. In accordance with this, it states that:

- The State must respect, protect, promote, and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities.
- Sustainable development requires the integration of social, economic, and environmental factors in the planning, implementation, and evaluation of decisions to ensure that development serves present and future generations.
- Everyone has the right 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.

In addition, the national environmental management principles contained within NEMA state that:

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

- Development must be socially, environmentally and economically sustainable.
- 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.

The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.

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

The White Paper on Renewable Energy Policy (South Africa, 2003) Supplements Government's predominant policy on energy as set out in the White Paper on the Energy Policy of the Republic of South Africa (DME, 1998). The policy recognises the potential of RE and aims to create the necessary conditions for the development and commercial implementation of RE technologies. The position of the White Paper on RE is based on the integrated resource planning criterion of:

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

The White Paper on Renewable Energy of 2003 set a target of 10 000GWh to be generated from RE by 2013 to be produced mainly from biomass, wind, solar and small-scale hydro. The target was subsequently reviewed in 2009 during the RE summit of 2009. The objectives of the White Paper on Renewable Energy Policy are considered in six focal areas, namely, financial instruments, legal instruments, technology development, awareness raising, capacity building and education, and market-based and regulatory instruments. The policy supports the investment in RE facilities as they contribute towards ensuring energy security through the diversification of energy supply, reducing GHG emissions and the promotion of RE sources.

3.1.4. National Energy Act (No. 34 of 2008)

The purpose of the National Energy Act (No. 34 of 2008)(South Africa, 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 amongst other things, to:

- 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.

The National Energy Act therefore recognises the significant role which electricity plays 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 framework which supports the development of RE facilities for the greater environmental and social good.

3.1.5. Integrated Energy Plan (IEP) (2016)

The Integrated Energy Plan (IEP) (Department of Energy, 2016) (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.

The IEP is a multi-faceted, long-term energy framework which has multiple aims, some of which include:

- 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 macroeconomic factors.

A draft version of the Integrated Energy Plan (IEP) was released for comment on 25 November 2016. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The development of the IEP is an ongoing continuous process. It is reviewed periodically to take into account changes in the macroeconomic environment, developments in new technologies and changes in national priorities and imperatives, amongst others.

The eight key objectives of the integrated energy planning process, are as follows:

- Objective 1: Ensure security of supply.
- Objective 2: Minimise the cost of energy.
- Objective 3: Promote the creation of jobs and localisation.
- Objective 4: Minimise negative environmental impacts from the energy sector.
- Objective 5: Promote the conservation of water.
- Objective 6: Diversify supply sources and primary sources of energy.
- Objective 7: Promote energy efficiency in the economy.
- Objective 8: Increase access to modern energy.

3.1.6. Integrated Resources Plan (IRP) (2019)

The Integrated Resource Plan (IRP)(Department of Energy, 2019) for electricity 2010 – 2030 is a subset of the IEP and constitutes South Africa's National electricity plan. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The IRP also serves as input to other planning functions,

including amongst others, economic development and funding, and environmental and social policy formulation.

The current iteration of the IRP led to the Revised Balanced Scenario (RBS) that was published in October 2010. Following a round of public participation which was conducted in November/December 2010, several changes were made to the IRP model assumptions. The document outlines the proposed generation new-build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on a cost-optimal solution for new-build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation.

3.1.7. Integrated Resource Plan (IRP) (2024) Draft

Please note: The Integrated Resource Plan of 2024 (Department of Energy, 2024) is included to present the most recent developments within the electricity industry of South Africa, although it is still only in draft format and therefore focus should remain on the 2019 version until the final document is released.

The Integrated Resource Plan (IRP) is a living plan that is expected to be regularly updated as necessitated by the changing circumstances. The main purpose of the IRP is to ensure security of electricity supply necessary by balancing supply and demand, while considering the environmental and total cost of supply. South Africa continues to pursue a diversified energy mix that will provide security of supply while ensuring compliance with its emissions reduction plan. South Africa's approach to energy security in in line with international trends and developments.

The report states the role of coal, nuclear, gas, renewable, storage and hydrogen all form part in the future of South Africa's energy production. Explaining in greater detail how each can contribute to the sustainability of the power generation and delivery within South Africa. The role of each has contributed to an estimated generation capacity within each sector as indicated in **Table 3.1**.

Table 3.1: Published Draft IRP 2024

	Coal	Gas – IPP Programme	Gas - Eskom	Dispatchable Capacity	Nuclear	Hydro	Pumped Storage	CSP	Solar PV	Wind	Hybrid IPP Programme	Distributed Generation[k]	BESS – IPP Programme	BESS - Eskom	Unserved Energy (TWh)
Current Base (MW)	38 800	1 005	2 825	-	1 860	1 600	2732	500	2 287	3 443	-	5 000	-	20	
2024	720							100			150	900		199	13.06
2025	720	1 220							2 115	644	476	900	513	141	7.63
2026										140		900			7.66
2027		1 000								684		900	2 000 615		4.55
2028		1 000	3 000						500			900	615		0.22
2029									500	1 500		900			0.25
2030		1 000		1 376					500	1 500		900			0.27
Additional New Capacity (MW)	1 440	4 220	3 000	1 376				100	3 615	4 468	626	6 300	3 743	360	

Installed Capacity
Capacity under construction
Capacity procured
New Capacity
Distributed Generation Capacity for own use
Unserved Energy, preferred as low as possible

3.1.8. National Development Plan 2030 (2012)

The National Development Plan (NDP) 2030 (South Africa, 2012) 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. The NDP aims to achieve this by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state and promoting leadership and partnerships throughout society. While the achievement of the objectives of the NDP requires progress on a broad front, three priorities stand out, namely:

- Raising employment through faster economic growth.
- Improving the quality of education, skills development and innovation.
- Building the capability of the state to play a developmental, transformative role.

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:

- 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.

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

3.1.9. National Climate Change Response White Paper (2011)

South Africa will build the climate resilience of the country, its economy and its people and manage the transition to a climate-resilient, equitable and internationally competitive lower-carbon economy and society in a manner that simultaneously addresses South Africa’s over-riding national priorities for sustainable development, job creation, improved public and environmental health, poverty eradication, and social equality. In this regard, South Africa will (South Africa, 2011):

- Effectively manage inevitable climate change impacts through interventions that build and sustain South Africa’s social, economic and environmental resilience and emergency response capacity.
- Make a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

The achievement of South Africa’s climate change response objective is guided by the principles set out in the Constitution, the Bill of Rights, the National Environmental Management Act (NEMA), the MDGs and the UNFCCC. The principles include, amongst others:

- **Common but differentiated responsibilities and respective capabilities** – aligning our domestic measures to reduce the country's GHG emissions and adapt to the adverse effects of climate change with our unique national circumstances, stage of development and capacity to act.
- **Equity** – ensuring a fair allocation of effort, cost and benefits in the context of the need to address disproportionate vulnerabilities, responsibilities, capabilities, disparities and inequalities.
- **Special needs and circumstances** – considering the special needs and circumstances of localities and people that are particularly vulnerable to the adverse effects of climate change, including vulnerable groups such as women, and especially poor and/or rural women; children, especially infants and child headed families; the aged; the sick; and the physically challenged.
- **Uplifting the poor and vulnerable** – climate change policies and measures should address the needs of the poor and vulnerable and ensure human dignity, whilst endeavouring to attain environmental, social and economic sustainability.
- **Intra- and Inter-generational sustainability** – managing our ecological, social and economic resources and capital responsibly for current and future generations.
- **The Precautionary Principle** – applying a risk-averse and cautious approach, which takes into account the limits of current knowledge about the consequences of decisions and actions.
- **The Polluter Pays Principle** – those responsible for harming the environment paying the costs of remedying pollution and environmental degradation and supporting any consequent adaptive response that may be required.
- **Informed participation** – enhancing public awareness and understanding of climate change causes and impacts to promote participation and action at all levels.
- **Economic, social and ecological pillars of sustainable development** – recognising that a robust and sustainable economy and a healthy society depends on the services that well-functioning ecosystems provide, and that enhancing the sustainability of the economic, social and ecological services is an integral component of an effective and efficient climate change response.

3.1.10. Strategic Infrastructure Project (SIP)

The Presidential Infrastructure Coordinating Committee (PICC) are integrating and phasing investment plans across 18 Strategic Infrastructure Projects (SIPs) which have the following five core functions (South Africa, 2020):

- To unlock opportunity.
- Transform the economic landscape.
- Create new jobs.
- Strengthen the delivery of basic services.
- Support the integration of African economies.

A balanced approach is being fostered through greening of the economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development and enabling regional integration.

SIP 8 of the energy SIPs supports the development of RE projects as follow:

- SIP 8: Green energy in support of the South African economy:

Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010) and supports bio-fuel production facilities.

The development of the proposed project is therefore also aligned with SIP 8 as it constitutes a green energy initiative which would contribute clean energy in accordance with the IRP 2010 – 2030.

3.2. Provincial Policies

This section provides an overview of the most relevant provincial policies. The proposed Benya Solar PV Facility is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

3.2.1. Limpopo Development Plan (LDP) 2020-2025

The Limpopo Development Plan (LDP) 2020-2025 is the socio-economic development blueprint for the Limpopo Province. It outlines the contribution of the Limpopo Province to the National Development Plan (NDP) and provides a framework for the strategic plans of provincial government departments and municipalities in the province. The LSDF should build on and give spatial expression to the LDP 2020-2025 components, where possible and relevant. The LDP also creates a structure for the constructive participation of private-sector business, organised labour and citizens, towards the achievement of the provincial growth and development objectives (Limpopo Province, 2021).

The LDP 2020-2025 defines the provincial long-term vision as “Limpopo – Africa’s New Pride. A resilient, vibrant, prosperous Province inspired by its diverse and creative people and its environment.”

The objectives of the Limpopo Development Plan are the following:

- Ensure sustainable development.
- Create decent employment through inclusive economic growth and sustainable livelihoods.
- Improve the quality of life of citizens.
- Raise the effectiveness and efficiency of a developmental public service.
- Promote vibrant and equitable sustainable rural communities.
- Prioritise social protection and social investment.

3.2.2. Limpopo Provincial Spatial Development Framework (2024)

Vision

“The Limpopo Spatial Development Framework envisions a provincial spatial structure where the natural environment and valuable agricultural land are protected for future generations, with a strong, diverse and growing economy, and that offers its residents high quality living environments and good job.”(Limpopo Province, 2024)

Provincial Spatial Outcomes

Provincial Spatial Outcome One

A network of consolidated, transformed and well connected urban nodes, regional development anchors and rural service centres that enable Limpopo to derive maximum transformative benefit from urbanisation and concentrated rural settlements, enabling climate change adaptation, inclusive economic development and equal, effective and efficient access to social services in support of equitable and inclusive provincial human capital development.

Provincial Spatial Outcome Two

Provincial-scale corridors and productive rural regions enable sustainable livelihoods supported by economic diversification through green industrialisation and participation in the Fourth Industrial Revolution, mutually beneficial urban-rural linkages, and wise management, nurturing and conservation of ecological assets and ecosystem services.

Provincial Spatial Outcome Three

Provincial connectivity and movement infrastructure systems are strategically located, extended and maintained, to support a diverse, ecologically sustainable, adaptive, regenerative and inclusive economy, and a set of key provincial, national and regional gateway cities and towns.

Provincial Spatial Outcome Four

Productive regions are supported by sustainable resource economies and strong and resilient regional development anchors provide effective, efficient and equitable access to people living in rural areas to the provincial, national and global economy.

Provincial Spatial Outcome Five

The provincial ecological infrastructure and natural resource foundation are well-protected and managed, to enable climate change mitigation and sustainable and equitable access to water, high-potential agricultural land, minerals and other natural resources, both for current and future generations.

Development Objectives

- Capitalise on the Province's strategic location within the SADC region to facilitate trade links and regional cooperation on resource sharing;
- Capitalise on, and improve regional and local connectivity to establish a connected network of nodes and settlements;
- Provide a strategic and coherent rationale for public sector investment, including engineering, community and economic infrastructure, to optimise service delivery;
- Encourage urban and rural spatial restructuring to address spatial injustice and facilitate climate change mitigation and adaptation;

- Aggressively protect and enhance the province's natural resources, including scarce fresh water sources and high biodiversity landscapes;
- Guard valuable agricultural land as a scarce resource and national asset;
- Consolidate and enhance the province's ecotourism product;
- Encourage and institutionalise the sustainable development of its massive mineral potential and encourage diversification and industrialisation through green economy initiatives; and
- Create an enabling environment for both large- and small-scale business development (retail, office, commercial, industrial).

3.3. District and Local Municipality Policies

The strategic policies at the DM and LM levels have similar objectives for the respective areas, namely, to accelerate economic growth, create jobs, and uplift communities. The proposed Benya Solar PV Facility is considered to also align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

3.3.1. Waterberg District Municipality Integrated Development Plan 2024/2025

Vision

"To be the best energy hub and ecotourism destination in Southern Africa."(Waterberg District Municipality, 2024)

Mission

"To invest in a constituency of talented human capital who are motivated and innovative to build a sustainable economy in the field of energy, minerals and eco-tourism for the benefit of all our communities."

Values

- Honesty
- Respect
- Fairness
- Integrity
- Accountability
- Accessibility
- Effectiveness
- Ubuntu

3.3.2. Waterberg District Municipality Integrated Development Framework First Draft 2021

Vision

"Waterberg District - the pride of Limpopo: A spatially functional and equitable district that is a conducive living environment for all, an energy hub and an eco-tourism destination."(Waterberg District Municipality, 2021)

Challenges

- The District is vulnerable in terms of rainfall erosivity, especially the northern parts of the District.
- Due to climate change, extreme rainfall days are predicted to increase in the southern part of the District around Mabula, Bela-Bela and Modimolle which can lead to an increase in localised flooding events. This will affect infrastructure provision such as drainage systems.
- In terms of flood risk, the worst affected settlements are between Northam and Thabazimbi, and in Mokopane. Mookgophong and Lephalale reflect a lower risk to flooding. Considering the important role these settlements play in the District (social and economic), these settlements need to review their climate adaptation measures and proactively identify settlements located in potential flood-risk areas.
- Areas such as Lephalale and Thabazimbi in the northern and western parts of the District will experience higher climate change than the central and eastern parts. Increases in very hot days could affect agriculture, plant and animal life and put more pressure on scare water sources.
- Drought tendency due to climate change is expected to increase along the northern and southwestern boarders of the District. This will impact both intensive agriculture as well as animal husbandry (including game farming). Climate change and especially increased exposure to drought or flooding has a direct impact on the lack or surplus of water in a region.
- The most prominent mountains are located towards the eastern and southern parts of the District; these areas limit urban development and increase the costs associated with infrastructure provision.
- The river ecosystems in the Waterberg District are under pressure, with approximately a large portion of all rivers classified as endangered and critically endangered. The lack of water conservation and demand management is therefore a key risk.
- Destruction of heritage resources especially due to uncontrolled and unplanned development, air pollution, uncontrolled recreational activities, etc.
- An area of 2,099,564 ha, or 46.7% of the total district land area of 4,493,029 ha, is categorised as Protected Areas, CBA 1 and CBA 2. This is a significant figure, which highlights the importance of coordinated and harmonious use of land.

Opportunities

- Nature reserves and protected areas, including the Waterberg Biosphere and Makapans World Heritage Site, provide eco-tourism opportunities. However, these areas should be maintained and protected in line with the Waterberg District Bioregional Plan, 2016 and Environmental Management Framework.
- The accessibility to the natural assets should be promoted not only internationally and nationally, but also locally and require the identified routes to be developed.
- Sustainable production can create new value-chains in the District whilst preserving the environment.
- Sustainable water management practices are an opportunity that promote water recycling, etc.
- With an increased risk of climate change, it is important to explore options to manage the loss of moisture due to evapotranspiration, especially since the global warming-induced moisture deficit may have significant implications on agriculture and hydrological activities.

- Agricultural development programmes, especially for emerging farmers, have the opportunity to be improved to incorporate the impact of climate change.
- Promote and encourage programme to reverse environmental degradation.
- Promote and encourage sustainable agriculture production and agro-processing within areas with high agriculture potential. Protected Agriculture Ares (PAA) in Waterberg correlate with the moderate to high land capability areas. PAA are mostly found along the south-western and eastern parts of the District (Bela-Bela and Modimolle-Mookgophong Municipalities and to a lesser extent the Thabazimbi Municipality).
- Promote and encourage programme to encourage and support sustainable land use practices, restore and rehabilitate degraded land, encourage Biodiversity Conservation, etc.
- Promote and encourage the Working for Wetlands programme in order to protect and rehabilitate wetlands as well as education and knowledge sharing.

3.3.3. Thabazimbi Local Municipality Integrated Development Plan 2024/2025

Vision

"A municipality with diversified economy in the provision of excellent sustainable services."(Thabazimbi Local Municipality, 2024)

Mission

"To be a leading municipality in the provision of excellent sustainable services in collaboration with stakeholders."

Values

- Honesty and integrity
- Accountability
- Innovation and Transformation
- Safe environment
- Collaboration
- Transparency and Fairness
- Community involvement

3.3.4. Thabazimbi Local Municipality Spatial Development Framework 2022

With regards to the SDF, through the compilation of the status quo, it is clear that the Thabazimbi Local Municipality is multi-faceted and has immense exploration potential in terms of primary, secondary and tertiary economic activities (Thabazimbi Local Municipality, 2022). The three major sectors that should be explored in the municipality are:

- Mining – exploration of minerals
- Agriculture – exploration of agricultural opportunities
- Tourism (specifically hunting and game/nature reserves) – exploration as an experience

Therefore, the spatial vision of the Municipality is:

"Thabazimbi: the Centre for Exploration."

The spatial vision aims at providing a means to realise the municipal vision and mission and gives the Local Municipality a branding and management tool to ensure law enforcement with regards to spatial development and planning as a whole.

3.4. Policy Review Conclusion

The review of relevant legislation, policies and documentation pertaining to the energy sector indicates that renewable or green energy (i.e., energy generated by naturally occurring renewable resources) and therefore, the establishment of the proposed Benya Solar PV Facility is supported at a national, provincial, and local level and that the proposed project will contribute positively towards several targets and policy aims. Specifically, those relating to social and economic development and upliftment, and employment creation.

4. SOCIO-ECONOMIC PROFILES

This Chapter provides an overview of the socio-economic environment within which the Benya Solar PV Facility is proposed for development and provides the socio-economic basis against which potential issues can be identified.

4.1. Limpopo Province

The Limpopo Province is located in the northernmost part of South Africa, bordering Mozambique, Zimbabwe and Botswana. It is flanked by three South African provinces: the North West Province to the south-west, and Gauteng and Mpumalanga to the south. The Limpopo Province is named after the Limpopo River, which flows along its northern border, separating South Africa from Zimbabwe and Mozambique.

Covering an expansive area of 125 754 km^2 and home to a population of 5 799 090 people, the Limpopo Province ranks as the fifth largest province in South Africa in terms of both size and population. Its capital and largest city is Polokwane (formerly known as Pietersburg), centrally located within the province. Other significant towns and cities, such as Bela-Bela (Warmbad), Lephalale (Ellisras), Makhado (Louis Trichardt), Musina (Messina), Thabazimbi, and Tzaneen, are scattered throughout the province.

Geographically, the Limpopo Province comprises Lowveld plains interspersed with several mountain ranges that emerge from the Highveld plateau in the southern and central regions. These ranges include the Soutpans Mountains stretching from east to west, as well as the Water Mountains in the southwest. The Lowveld spans the eastern, northern, and western parts of the province, adorned with iconic mopani and baobab trees that define its unique landscape.

Within the eastern region lies the untouched splendour of the majestic Kruger National Park. Established in 1926, it was South Africa's first national park and has since become one of the country's most popular tourist destinations. The region's abundant wildlife diversity also contributes to a thriving hunting industry, adding to the province's allure as a tourist hotspot.

The province's economic activity is primarily driven by its rich mineral deposits, which include platinum-group metals, iron ore, chromium, high and middle-grade coking coal, diamonds, antimony, phosphate, copper, gold, emeralds, scheelite, magnetite, vermiculite, silicon, and mica. Additionally, agricultural pursuits thrive in certain climatic regions, allowing for double harvesting seasons. As a result, the province boasts the largest production of various crops, including sunflowers, cotton, maize, peanuts in the Bela-Bela and Modimolle region, as well as bananas, litchis, pineapples, mangoes, pawpaw’s, and various nuts in the Tzaneen and Makhado region. Coffee and tea plantations in the province also provide numerous employment opportunities for the local population.

The Limpopo Province serves as a vital cross-border transportation route from South Africa to other southern African countries. The N1 national route connects Cape Town to Mussina in the northern part of South Africa before crossing over to Zimbabwe at the Beit Bridge border over the Limpopo River. In Zimbabwe, the road continues as the A4 and connects South Africa to Harare, the capital of Zimbabwe.

Administratively, the Limpopo province is divided into five district municipalities, which are further subdivided into 22 local municipalities (**Figure 4.1**).

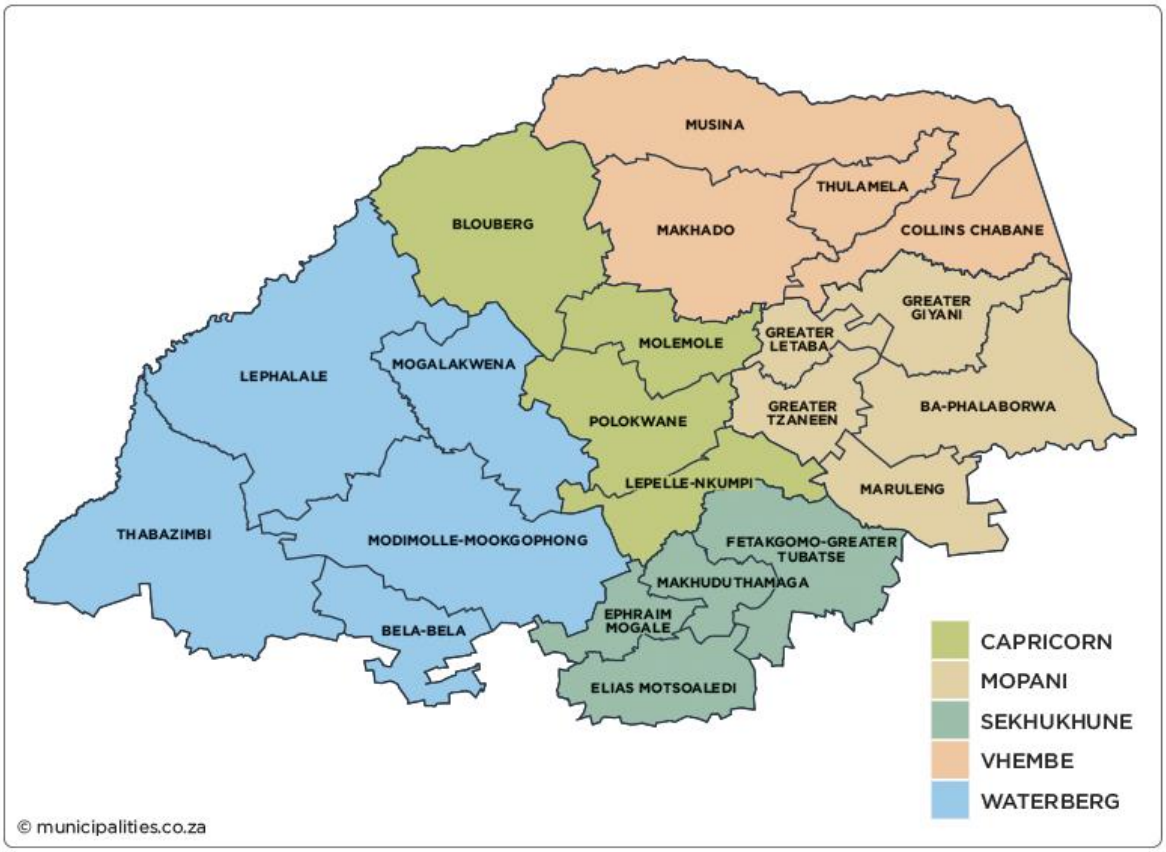

Figure 4.1: Map showing the DMs of the Limpopo Province (Source: www.municipalities.co.za)

4.2. Waterberg District Municipality

The Waterberg District Municipality (DM) is a Category C municipality situated in the western part of the Limpopo Province, sharing borders with the Capricorn DM to the north and the Sekhukhune DM to the east. To the south-west, the Waterberg DM is adjacent to the North West Province, while the Gauteng Province lies to its south-east.

As the largest of the five district municipalities in the Limpopo Province, the Waterberg DM encompasses over a third of the province's total area. It plays a significant role as a border control region, with five border control points: Groblersbrug, Stockpoort, Derdepoort, Zanzibar, and Platjan, strategically located along the South African and Botswana border. The major towns within the district include Bela-Bela, Lephalale, Modimolle, Mookgophong, and Thabazimbi.

One notable feature of the region is the Waterberg Biosphere, a UNESCO-designated Biosphere Reserve. This expansive area, spanning approximately 654 033 hectares, showcases an intricate rock formation shaped by millions of years of riverine erosion, resulting in stunning bluff and butte landforms.

The region's economy thrives on mining, tourism, and agricultural activities, with mining serving as the primary economic driver. The Waterberg DM is renowned as one of South Africa's premier ecotourism destinations, offering diverse wildlife, birdlife, and picturesque landscapes throughout the

region. Key minerals extracted in the area include platinum, iron ore, coal, and diamonds, with the region contributing 40% of the national coal reserves. The Medupi power station, the fourth largest in the world, is also located in this district, playing a crucial role in power generation for South Africa.

Agriculture in the Waterberg DM is predominantly focused on game farming, although livestock and the cultivation of crops such as cotton, sunflowers, tobacco, and soybeans are also prevalent. The district's tourism industry thrives on the diverse Bushveld region, encompassing privately owned game reserves that provide opportunities for leisure activities and hunting.

The Waterberg District Municipality is further divided into five local municipalities: Bela-Bela LM, Lephalale LM, Modimolle-Mookgopong LM, Mogalakwena LM, and Thabazimbi LM (**Figure 4.2**).

Figure 4.2: Map showing the LMs of the Waterberg DM (Source: www.municipalities.co.za)

4.3. Thabazimbi Local Municipality

The Thabazimbi Local Municipality (LM) is a Category B municipality situated within the Waterberg District Municipality, located in the south-western part of the Limpopo Province. It shares borders with the Lephalale LM to the north, and the Modimolle-Mookgophong LM and Bela-Bela LM to the east, all of which are part of the Waterberg DM. The northern boundary of the municipality is shared with Botswana, while its southern boundary adjoins the North West Province. The municipality encompasses the town of Thabazimbi and mining towns like Amandelbult Mine town.

The town of Thabazimbi and the entire municipality derive their name from the Tswana language, meaning "mountain of iron." This name originated from the discovery of abundant iron ore by J.H. Williams at Vliegpoort in 1919. Mining activities in the region began in the 1930s, primarily supporting the production of iron and steel. In addition to iron ore, the area is known for its platinum deposits and andalusite.

Agriculture plays a significant role in driving the local economy, with the production of commodities such as wheat, beans, and maize contributing to the region's prosperity. The Thabazimbi area also attracts tourism, with notable attractions including the Marakele National Park. The National Parks Board supports the park to the same high standards as the renowned Kruger National Park and Mapungubwe.

4.4. Project Site

The proposed Benya Solar PV Facility and associated grid connection infrastructure will be located on the Remaining Extent of Farm Portugal No. 198 and Farm Napoleon No. 216, situated in the Thabazimbi LM, a subdivision of the Waterberg DM, located in the Limpopo Province. The proposed Benya Solar PV Facility is located approximately 72km north-west of the town of Northam. The site is accessible via either the existing D113 or D1629 district roads, which traverse the proposed development. Refer to **Figure 1.1** illustrating the locality of the proposed Benya Solar PV Facility. Please refer to the photos below (**Figure 4.3** to **Figure 4.10**) for a better understanding of the surroundings in which the project is to be located.

Figure 4.3: Aerial photograph of the site, taken towards the north

Figure 4.4: Aerial photograph of the site, taken towards the north-east

Figure 4.5: Aerial photograph of the site, taken towards the east

Figure 4.6: Aerial photograph of the site, taken towards the south-east

Figure 4.7: Aerial photograph of the site, taken towards the south

Figure 4.8: Aerial photograph of the site, taken towards the south-west

Figure 4.9: Aerial photograph of the site, taken towards the west

Figure 4.10: Aerial photograph of the site, taken towards the north-west

4.5. Surrounding Land Uses and Features

Most of the surrounding area has a low number of farmsteads/buildings therefore, the area includes a low population number. The proposed development area is located in the agricultural region of Dwaalboom/Northam with livestock, crop cultivation and game farming as the most prominent activities. The land uses and landcover of the region are illustrated in **Figure 4.11**.

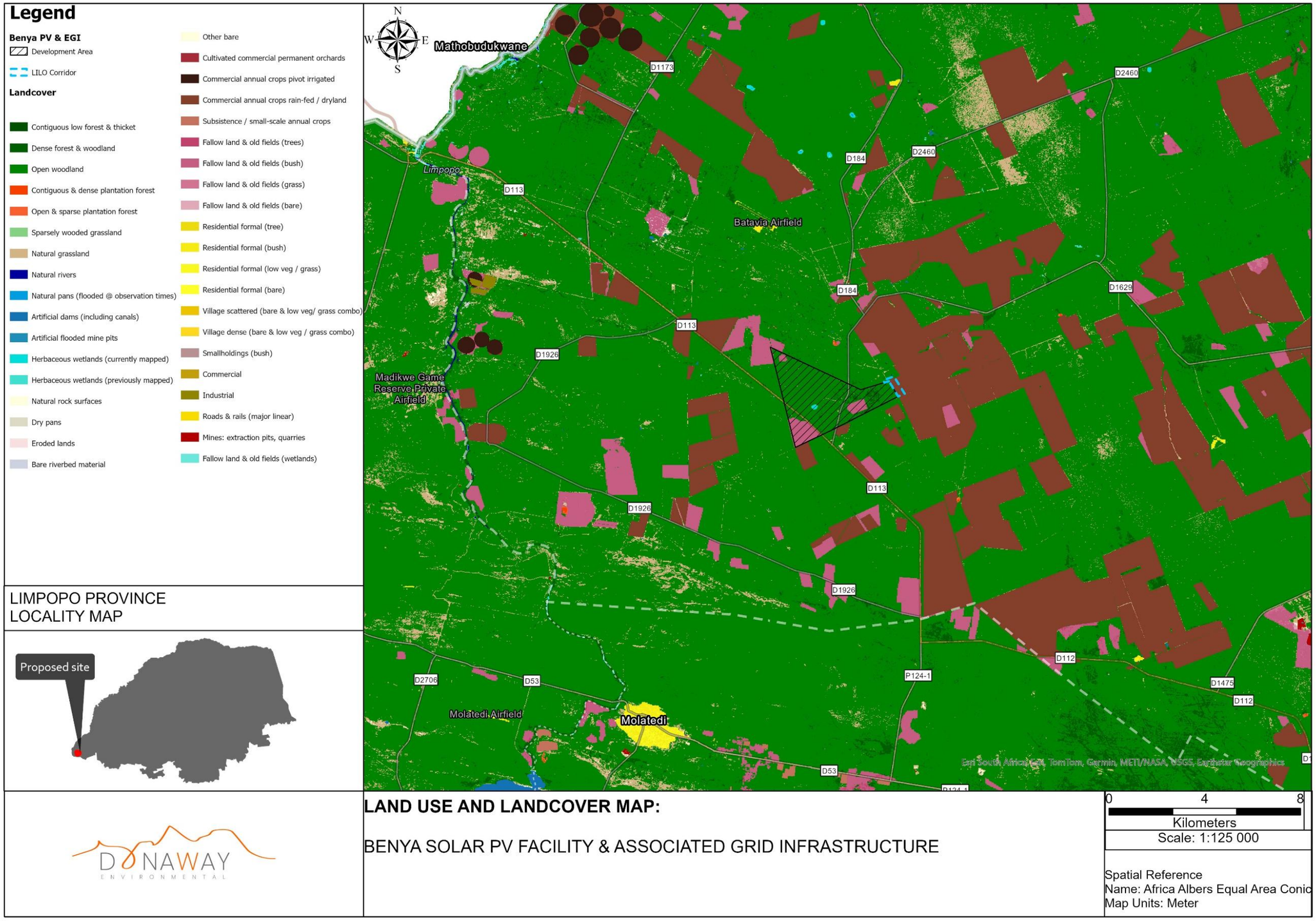

Figure 4.11: Landcover map of the proposed Benya Solar PV Facility near Northam, Limpopo Province

4.6. Baseline Description of the Social Environment

The following subsections provide an overview of the socio-economic profile of the Thabazimbi LM. To provide context against which the LM's socio-economic profile can be compared, the socio-economic profiles (where available) of the Waterberg DM, Limpopo Province, and South Africa as a whole have been provided, where applicable. The data presented in this section have been derived from the 2011 Census (which may be outdated but is deemed sufficient for the purpose of this study), Statistics South Africa: South Africa Community Survey 2016, 2022 Census (latest release with limited data in some sections), the Local Government Handbook South Africa 2021, South African Police Service official crime statistics reports, the Limpopo Development Plan (LDP) 2020 – 2025, Limpopo Provincial Spatial Development Framework (2024), Waterberg District Municipality Integrated Development Plan 2024/25, Waterberg District Municipality Spatial Development Framework First Draft 2021, Thabazimbi Local Municipality Integrated Development Plan 2024/2024 and the Thabazimbi Local Municipality Spatial Development Framework 2022. Note that some statistical graphs do not include all classifications, as some are in the minority, and a focus is made on the most prominent classifications. The population growth rate from 2001-2011 was not included as the Census data is too outdated for the purpose of this report, with the exception where no other data is available.

4.6.1. Population Size

Understanding the population dynamics of an area is important as it provides an overview of the human capital present within an area. It therefore provides an insight into the potential labour pool, from which workers may be sourced, as well as the local communities which may either be impacted by or benefit from. Population trends within an area also affect economic growth and the demand for goods and services.

Table 4.1: Overview of general statistics of South Africa, Limpopo Province, Waterberg DM and Thabazimbi LM (Source: Community Survey 2016 and Census 2022)

Region	Area (km^2)	Population total		Population change		Population density/km^2	
		2016	2022	Number of people	Percentage (%)	2016	2022
South Africa	1 220 813	55 653 654	62 027 503	6 374 289	+11.5%	45.6	50.8
Limpopo Province	125 806	5 799 090	6 572 721	773 631	+13.3%	46.1	52.2
Waterberg DM	45 315	745 759	762 862	17 103	+2.3%	16.5	16.8
Thabazimbi LM	11 214	96 232	65 047	-31 185	-32.4%	8.6	5.8

According to the Census 2022 and Census 2016 data (**Table 4.1**), the total population of South Africa, the Limpopo Province and the Waterberg DM all grew from 2016 to 2022, while the total population of the Thabazimbi LM decreased. Specifically, South Africa had an 11.5% increase or an increase of 6 374 289 people, the Limpopo Province had an increase of 13.3% or 773 631 people, and the Waterberg DM had an increase of 2.3% or 17 103 people. The Thabazimbi LM was the only region that underwent a decrease in its population, with its population decreasing by a total of 31 185 people or 32.4% from 2016 to 2022. The population density of the Thabazimbi LM was the lowest of the four

regions at 5.8 people/km^2, while the Limpopo Province had the highest population density at 52.2 people/km^2.

4.6.2. Population Group Dynamics

Information on population group dynamics provides a better understanding of the cultural dynamics which may be prevalent within the area. This is important in terms of determining the potential for community support, the likely community structure and appropriate / most-suited consultation practices to utilise when engaging with the local communities (and whether different communication strategies should be adopted for different community groups).

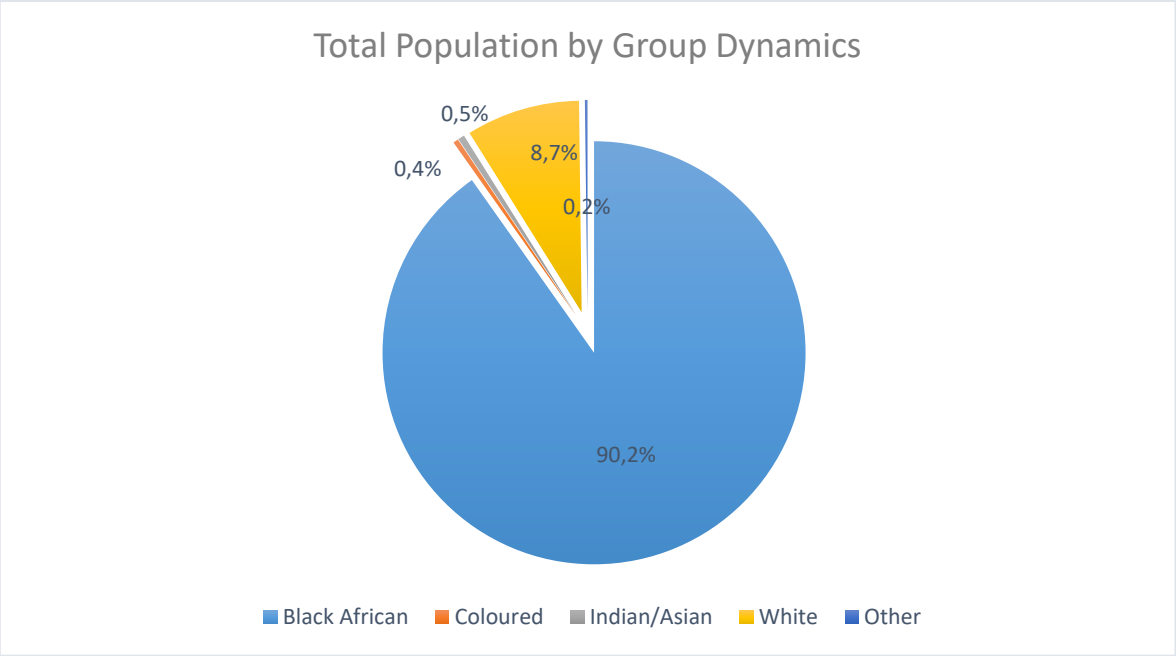

Figure 4.12: Total Population of the Waterberg DM by population group (Census 2022)

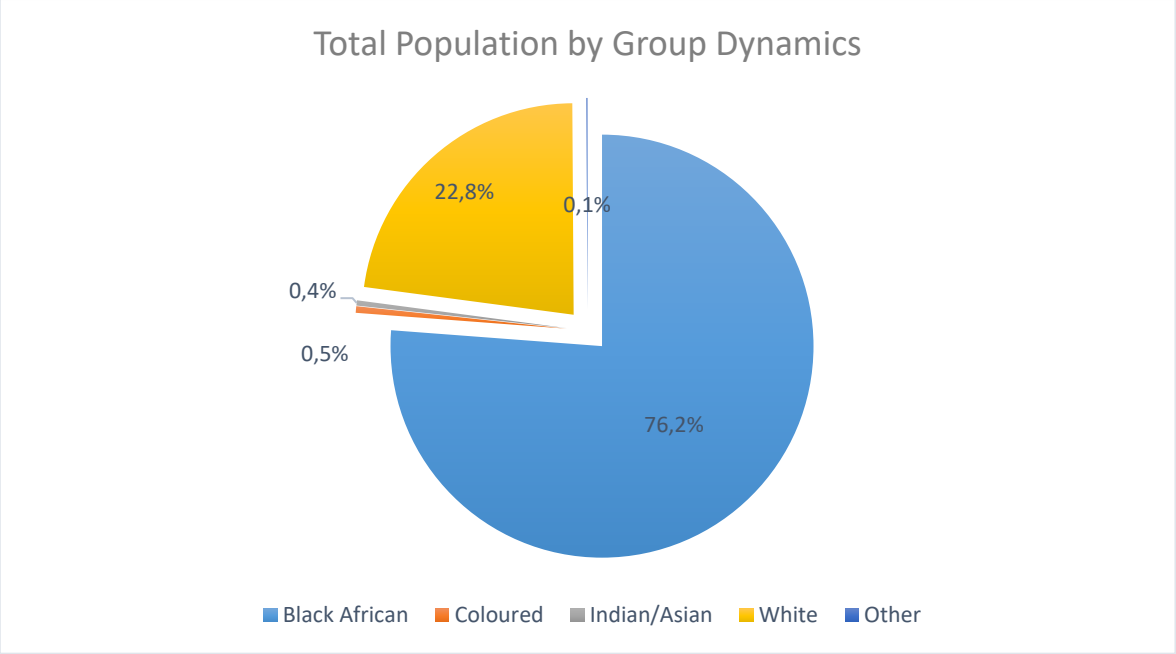

Figure 4.13: Total Population of the Thabazimbi LM by population group (Census 2022)

The Census 2022 data illustrated that the majority of the Waterberg DM (**Figure 4.12**), was composed of a black African population group at 90.2%, while the second most common population group were the white population at 8.7%. The Thabazimbi LM illustrated (**Figure 4.13**) similar distributions to the district municipality's population group distribution, with black Africans accounting for 76.2% of the population, while the white population group made up 22.8% of the population distribution. These group dynamics are comparable to those of the Limpopo Province (96.5%), specifically with a similar population group distribution.

4.6.3. Gender Profile

The gender profile of a population has significance in terms of gender distribution and understanding of the regions that have a more dominant gender. South Africa, the Limpopo Province and the Waterberg DM had more female-skewed gender distributions. In particular, South Africa has a 51.5% to 48.5% female-skewed distribution, the Limpopo Province had a 52.8% to 47.2% female-skewed distribution, and the Waterberg DM had a 50.8% to 49.2% female-skewed distribution. The Thabazimbi LM had a male-skewed gender distribution of 46.3% female and 53.7% male. The male-skewed distribution in the local municipality may be due to the dominant mining sector. Refer to **Figure 4.14 i**llustrating the gender distribution of the four geographical areas.

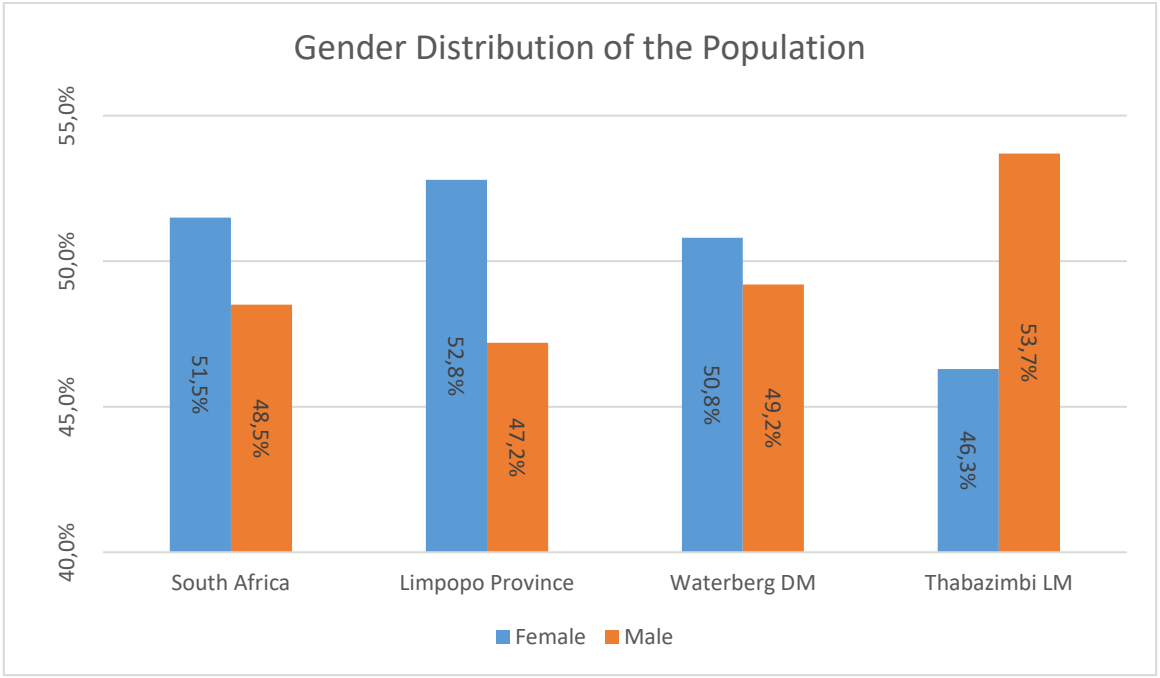

Figure 4.14: Population Distribution by Gender of South Africa, Limpopo Province, Waterberg DM and Thabazimbi LM (Census 2022)

4.6.4. Age Profile

The age structure of a population is important for planning purposes, as it provides insight into what services and the level to which such services are required. Age structure closely relates to the birth rate, death rate and migration of the population. For example, higher birth rates in a region tend to correlate with higher fertility rates and population growth, while a population with a higher ratio of elderly people indicates an area with a longer life expectancy.

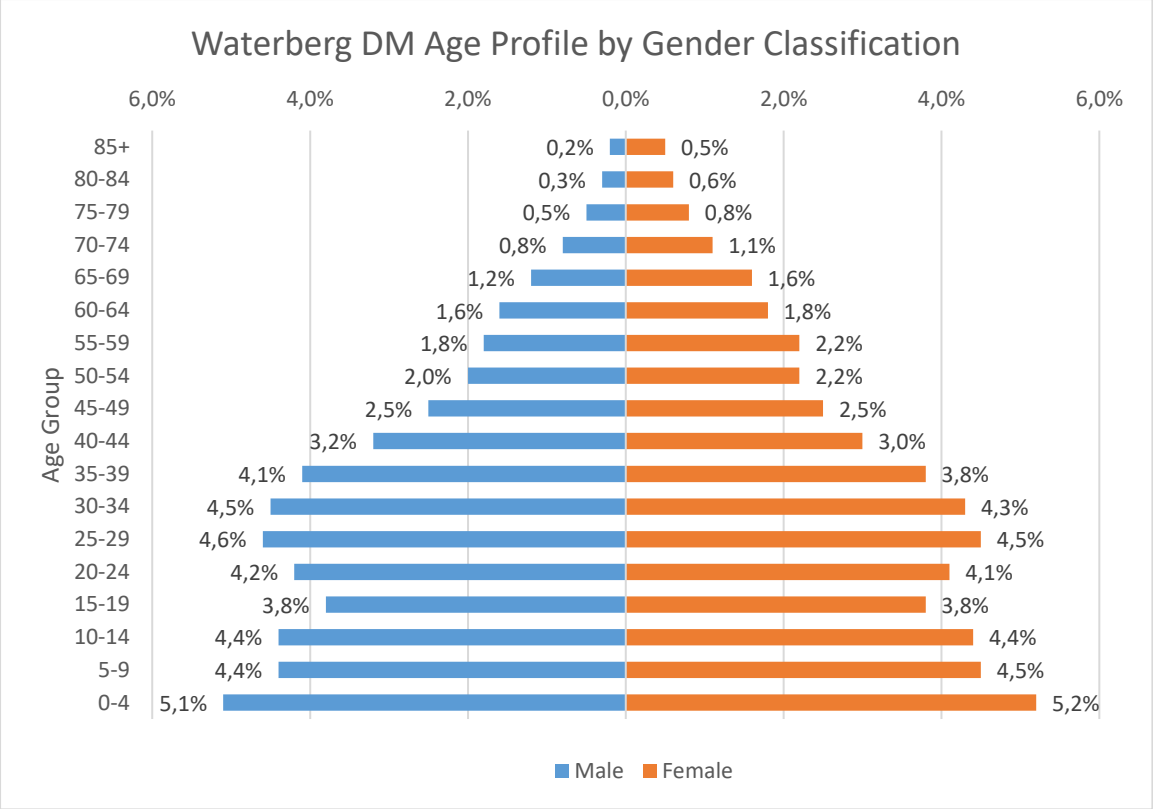

Figure 4.15: Waterberg DM Age and Gender Profile (Census 2022)

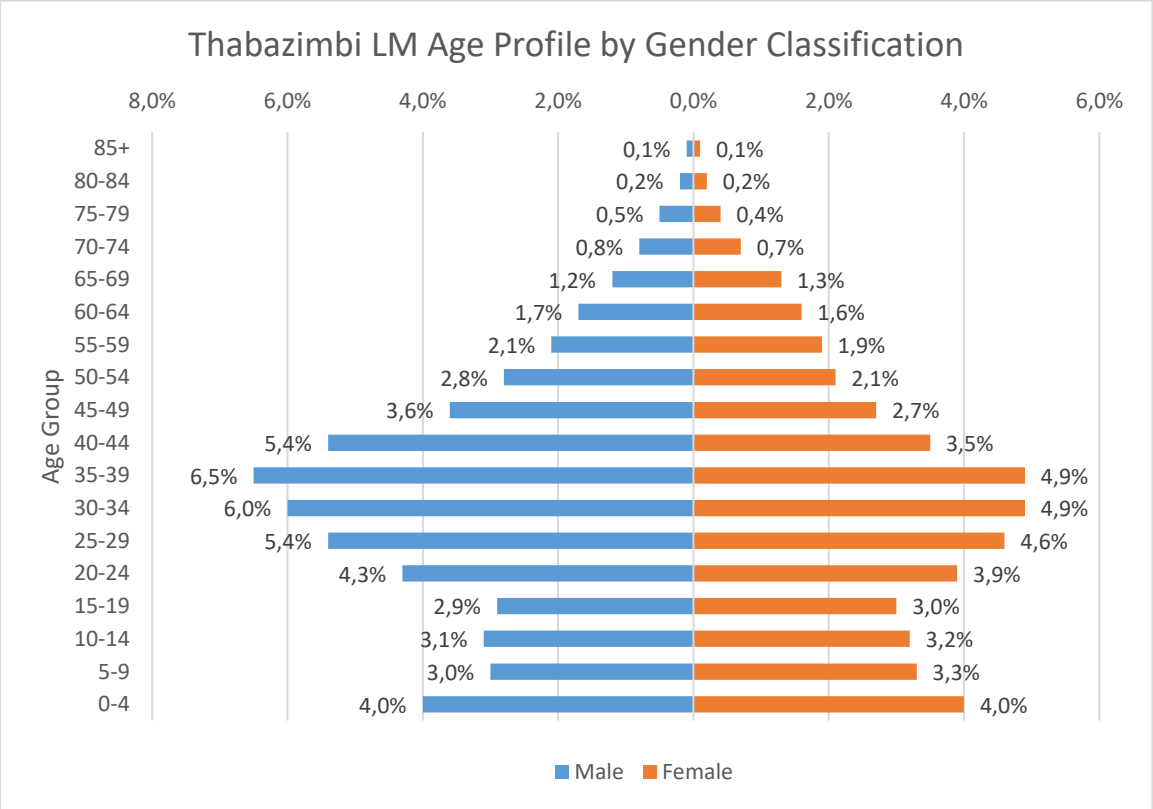

Figure 4.16: Thabazimbi LM Age and Gender Profile (Census 2022)

Information from the Census conducted in 2022 illustrates that the Thabazimbi LM (**Figure 4.16**) and Waterberg DM (**Figure 4.15**) had different population pyramids. The Waterberg DM illustrates a wide base narrowing towards the top, although with a greater distribution among 25 to 34 age groups, while the Thabazimbi LM illustrates a narrow base widening towards the middle age groups before narrowing towards the top. The Waterberg DM population pyramid illustrates a population that is slowly growing, although a decrease in growth has been observed in the younger age groups. The Thabazimbi LM illustrates a population that has experienced a significant decrease in its population, with a significant decrease in its younger population groups. The population pyramids correspond to the population changes as mentioned in Section 4.6.1. The decrease in population may be due to instability in the mining sector.

Overall, the Census data suggest that the population of the Thabazimbi LM and Waterberg DM illustrated a population with a significant distribution among the working-class age groups and a return to a population that may see growth in its future. This could have implications for future demographic trends, such as changes in workforce demographics, demands on social services, and overall economic development.

4.6.5. Dependency Ratio

An area's dependency ratio indicates that a portion of the population is dependent on the economically active portion of the population based on functional age groups. The dependent portion of the population comprises those below 15 years of age who are yet to enter the workforce and individuals 65 years and older who would typically already have retired from the workforce. In addition to not contributing towards the economy, such individuals are also likely to have additional needs which need to be catered for, such as access to suitable education facilities for the school-going population, and access to health care facilities in the case of the aged population. The dependency ratio is calculated by combining the number of children aged under 15 years and the number of adults aged 65 years and older, and dividing this by the working-age population (i.e., those aged between 15 and 64 years of age).

The Thabazimbi LM and Waterberg DM (**Figure 4.17**) have both experienced a decrease in the proportion of the population under 15 years of age from 2016 to 2022. On the other spectrum, both the Thabazimbi LM and Waterberg DM experienced growth in their elderly population (over 65 years of age). Specifically, the Thabazimbi LM population under 15 decreased from 24.4% to 20.6%, and the Waterberg DM population from 34.4% to 28.0%, while their population over the age of 65 increased from 2.2% to 5.5% in the Thabazimbi LM and from 5.1% to 7.6% in the Waterberg DM.

The dependency ratios of the Thabazimbi LM and Waterberg DM both decreased from 2016 to 2022 through a greater distribution among the 15 to 64 age group. The dependency ratio of the Thabazimbi LM decreased from 36.2% to 35.3%, implying that over a third of the population (35 individuals out of every 100) were considered dependent. The Waterberg DM dependency ratios decreased from 65.3% to 55.3% from 2016 to 2022.

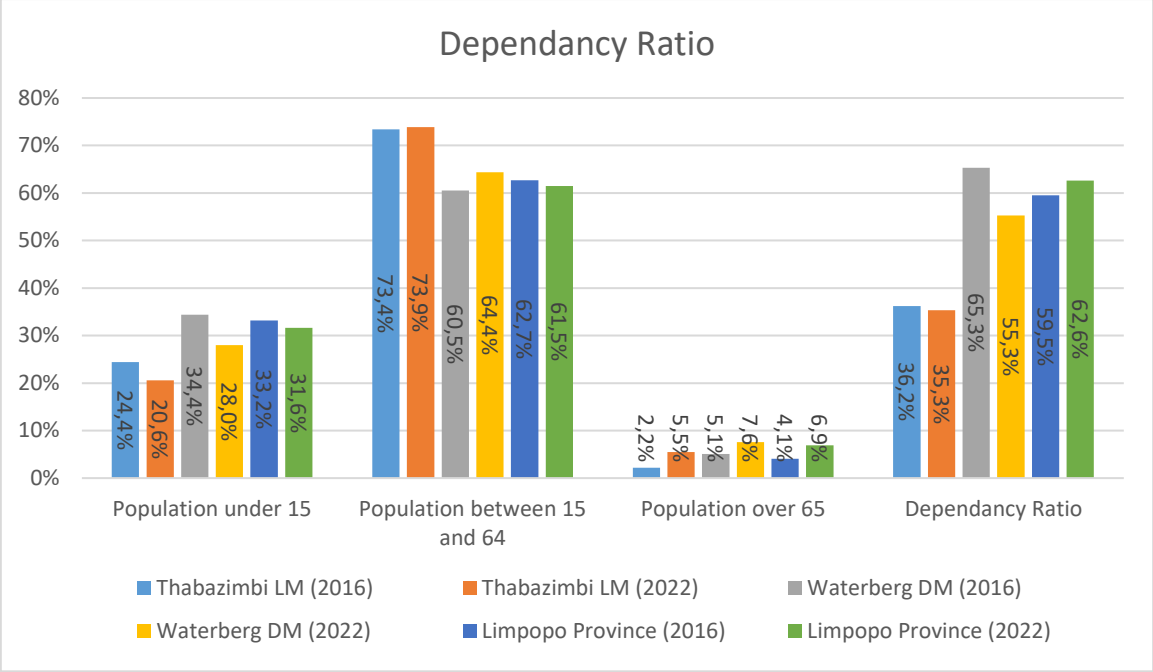

Figure 4.17: Limpopo Province, Waterberg DM and Thabazimbi LM Age Distribution (Community Survey 2016 and Census 2022)

4.6.6. Educational Levels

Education plays a pivotal role in community development. The level of education influences the growth and economic productivity of a region. There is a positive correlation between a higher level of education and the level of development and standard of living. Education levels in any given population will influence both economic and human development. While low levels of education typically lead to a low skills base within an area, high levels of education have the opposite effect, resulting in a skilled or highly skilled population. Household and personal income levels are also either positively or adversely affected by education levels (Runde, Bandur and Mclean, 2023).

In 2022, 4.8% of the population over the age of 20 in Thabazimbi LM (**Figure 4.18**) had no schooling, which increased from 3.7% compared to 2016, similar to the Waterberg DM no schooling ratio which increased from 7.2% to 8.3%. Both the Thabazimbi LM and Waterberg DM experienced an increase in their matric completion ratios and higher education levels. Specifically, the Thabazimbi LM experienced a rise from 33.1% to 39.9% for its matric completion, and the Waterberg DM rose from 29.7% to 33.6%. Although the education level improved in some classifications, both the Thabazimbi LM and Waterberg DM still have a high proportion of their population only completing some secondary education, with some secondary education the greatest distribution in the Waterberg DM at 35.9%.

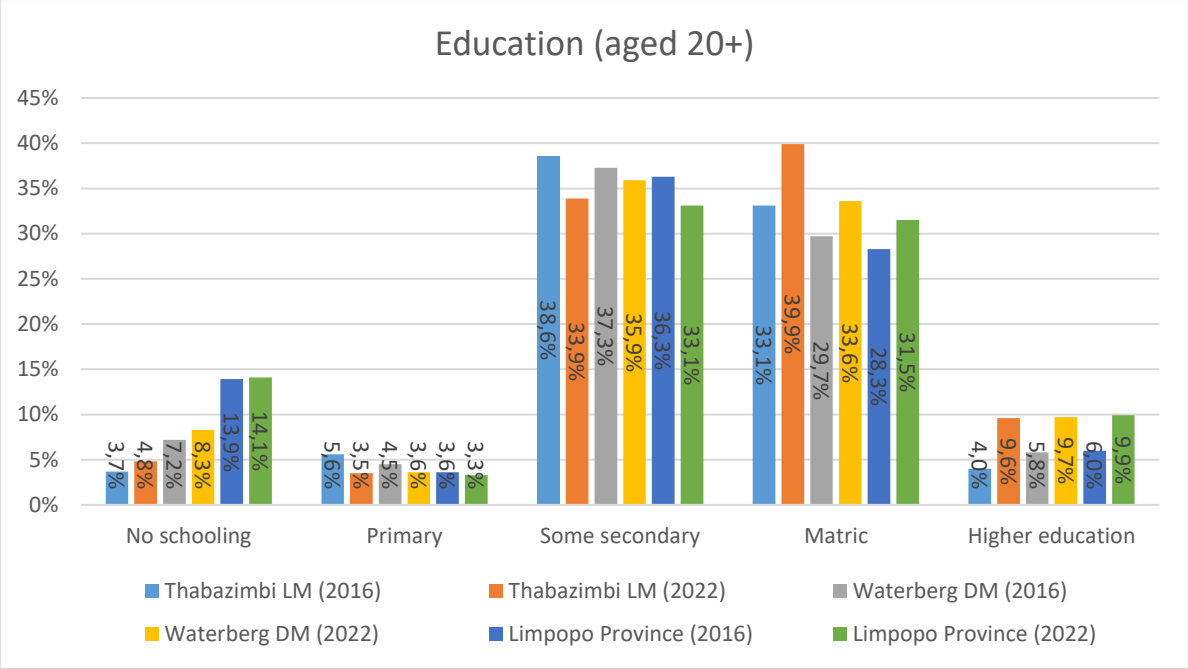

Figure 4.18: Limpopo Province, Waterberg DM and Thabazimbi LM Education Level (Community Survey 2016 and Census 2022)

4.6.7. Employment

The employment profile of an area is an important indicator of human development, as poverty and unemployment are closely correlated. The quantity of skilled labour is reflected, amongst other things, by the educational profile of the economically active population and the availability of training facilities in the region. The term labour force refers to those people who are available for employment in a certain area within a working age. According to Statistics South Africa, the definitions of the following employment indicators are:

- Economically active person: "A person of working age (between 15 and 65 years inclusive) who is available for work, and is either employed or is unemployed but has taken active steps to find work in the reference period."
- Employed: "Those who performed work for pay, profit or family gain for at least one hour in the seven days prior to the interview or who were absent from work during these seven days but did have some form of paid work to return to."
- Official and expanded definition of unemployment: "The unemployed are those people within the economically active population who: (a) did not work during the seven days prior to the interview, (b) want to work and are available to start work within two weeks of the interview, and (c) have taken active steps to look for work or start some form of self-employment in the four weeks prior to the interview."
- Labour force: "All employed and unemployed persons of working age".
- Unemployment rate: "The percentage of the economically active population that is unemployed."

According to the Census 2011 data, the employment percentage in the Thabazimbi LM was 50.5% (**Figure 4.19**), which is just over half of the working-age population. Compared to the Thabazimbi LM, the Waterberg DM and Limpopo Province had lower employment percentages of 38.4% for the

Waterberg DM and 27.4% for the Limpopo Province. The Thabazimbi LM had the lowest unemployment rate of the three regions at 13.1%, compared to the Waterberg DM at 15.0% and Limpopo Province at 17.5%. The Limpopo Province and Waterberg DM had higher not economically active percentages of 42.9% and 48.8% compared to the 34.4% of the Thabazimbi LM. The Thabazimbi LM, Waterberg DM and Limpopo Province would benefit from additional job opportunities to reduce their dependency on social grants and pensions.

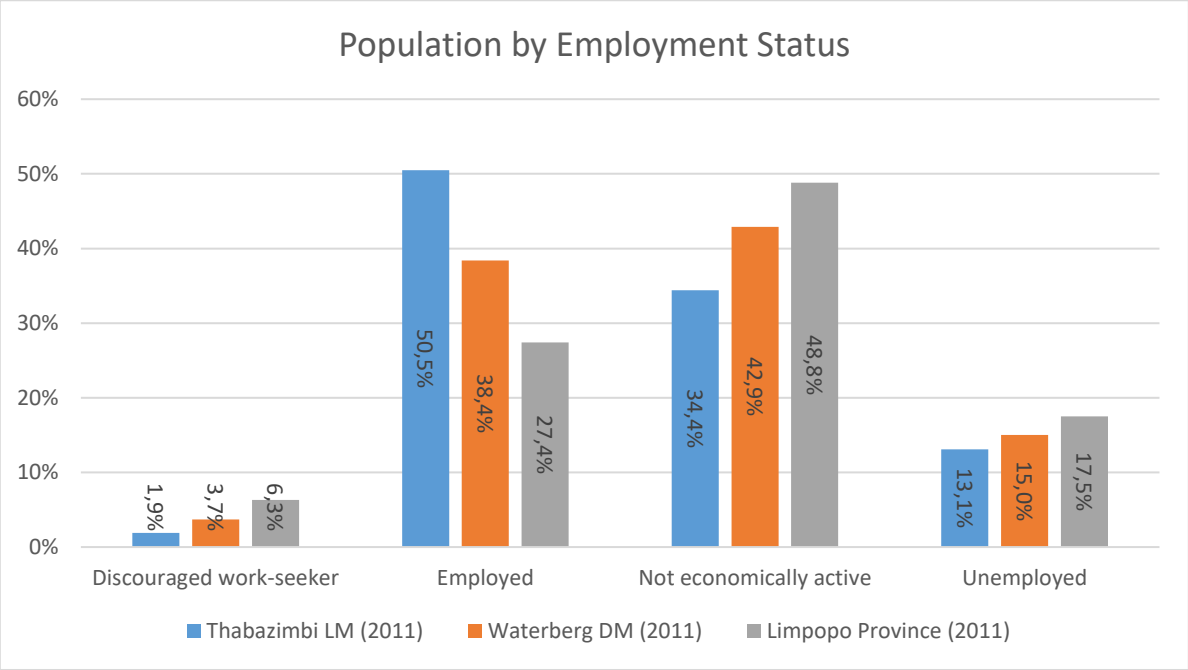

Figure 4.19: Employment Statistics for the Limpopo Province, Waterberg DM and Thabazimbi LM (Census 2011)

4.6.8. Annual Household Income Levels

To determine the population's standard of living, as well as their ability to pay for basic services, the income levels of the population per household are analysed. Household income levels are one avenue for determining poverty levels in a community. Households that have either no income or low income fall within the poverty level (R0 – R38 400 per annum), indicating the difficulty in meeting basic need requirements. Middle-income is classified as earning R38 401 – R307 200 per annum, and high income is classified as earning R307 201 or more per annum(Statistics South Africa, 2011).

Figure 4.20 illustrates that, at the time of the 2011 Census, 14.8% of households in Thabazimbi LM and 13.9% in the Waterberg DM had no annual household income. The majority of households (21.4%) in Thabazimbi LM had a household income between R40 000 and R75 000 per annum. The majority of households (21.4%) in Waterberg DM earned a lower annual income between R20 000 and R40 000 per annum. Both the Thabazimbi LM and Waterberg DM annual household income distributions were spread between the R10 000 and R75 000 mark.

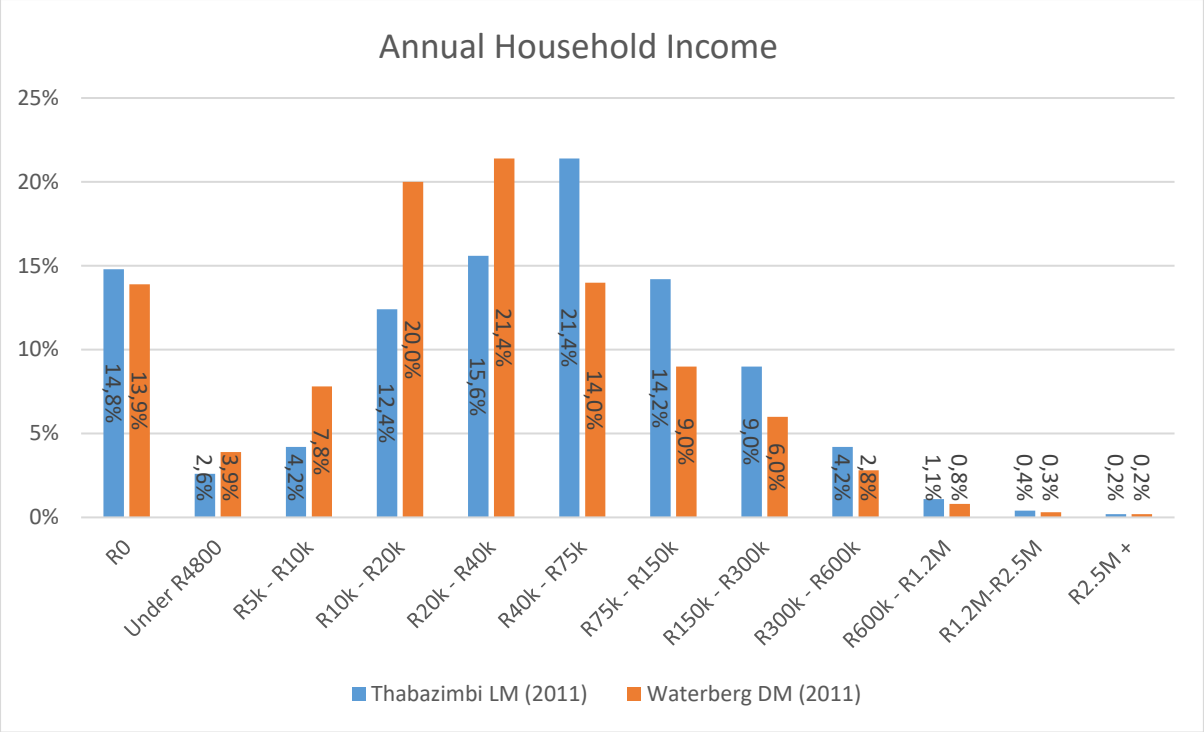

Figure 4.20: Annual Household Income for the Waterberg DM and Thabazimbi LM (Census 2011)

4.6.9. Economic Activities

According to the Thabazimbi LM IDP (Thabazimbi Local Municipality, 2024), the economy of the Thabazimbi LM area is primarily driven by the mining, agriculture, farming, and hunting sectors, though agriculture is in decline, posing a risk to farm-related jobs. Horticultural production remains minimal, while tourism facilities are adequate. The international recognition of the Waterberg Biosphere offers opportunities for marketing the area in terms of conservation, development, and logistical support. However, the commercial, retail, and manufacturing sectors contribute little to the provincial economy. To promote economic growth, the Thabazimbi Investment Initiative is being negotiated with stakeholders to drive development in the region.

4.6.10. Healthcare

According to the Thabazimbi LM IDP (Thabazimbi Local Municipality, 2024). There is a total of 18 healthcare facilities within the region, of which five were hospitals (one public, one private and three mine hospitals), 10 clinics and three mobile hospitals.

There is a shortage of clinics, as ideally, one clinic should service a radius of 5km, however, some wards do not have clinics. Additional challenges faced by the Municipality are that clinics do not operate for 24 hours. An HIV/AIDS Council was launched but is not functional, and thus, there is a shortage of AIDS Counsellors. HIV has had a massive impact on the population and has resulted in child-headed families and orphans who do not get the support needed in all respects. The impact of HIV/AIDS on the working force has also been great, as the result of employable adults losing their battle with HIV/AIDs results in both a young population and an ageing population who cannot enter the workforce. There is no hospice as more people are infected and affected; the hospitals cannot carry the burden. Lastly, there is a high turnover of professionals due to accommodation issues. This has been a persistent issue for

several years, and the need for accommodation should be addressed to secure health professionals within the region.

4.6.11. Crime

Crime negatively impacts communities through the loss of life, loss of property, and medical expenses, and can have a long-term negative impact on economic growth as high levels of crime dissuade investment and can reduce labour productivity. The annual crime statistics report published by the South African Police Service identifies 17 commonly reported serious crimes categorised under contact crimes, contact-related, property-related and other serious crimes (SAPS, 2024).

According to the South African Police Service, Annual Crime Statistics for the Limpopo Province, Waterberg DM and Thabazimbi LM all experienced increased reported crimes over the last few years, with the Limpopo Province illustrating the greatest increase. A total of 2 359 reports were made in 2024 in the Thabazimbi LM, under a quarter of the crimes within the Waterberg DM. No specific information regarding the crime was stated in the IDP of Thabazimbi LM.

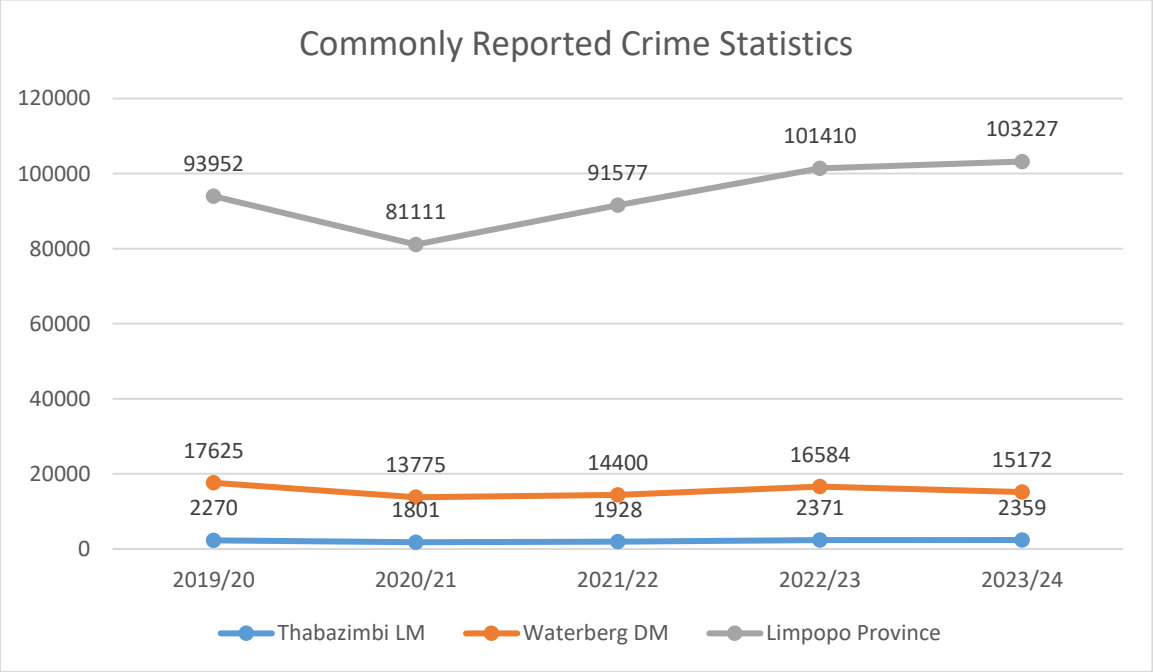

Figure 4.21: Commonly Reported Crime Statistics for Limpopo Province, Waterberg DM and Thabazimbi LM (South African Police Service Annual Crime Statistics 2020 to 2024)

4.6.12. Tourism

The Benya Solar PV Facility is located within the Limpopo Province, with the tourism sector regarded as a significant economic contributor within the region. Within a 10km radius of the proposed development, two private nature reserves are located, the Weltevrede Private Nature Reserve and the Doornlaagte Private Nature Reserve. The nature reserves include land that has been transformed for crop cultivation, although there is some lodging facilities located within the Weltevrede Private Nature Reserve boundary. The majority of these lodging facilities may provide accommodation for hunters visiting the region.

4.6.13. Households

According to the Census 2022 report, there were 26 832 households in the Thabazimbi LM, of which 83.6% were classed as formal dwellings, an increase from 68.0% in 2016 (**Figure 4.22**). Informal dwellings have seen a decrease within the Thabazimbi LM, with 14.8% in 2022 compared to 30.0% in 2016. Household tenure status in the Thabazimbi LM was skewed towards the owned and fully paid off class at 32.8% (**Figure 4.23**). No data were available from the Census 2022 report for household tenure status.

In comparison, Waterberg DM had 248 526 households in 2022, with formal dwellings making up the majority (91.6%), followed by informal dwellings at 7.5%. The majority (57.4%) of these households were owned and fully paid off in 2016. The average household size was 2.4 people per household in the Thabazimbi LM and 3.1 people per household in the Waterberg DM in 2016.

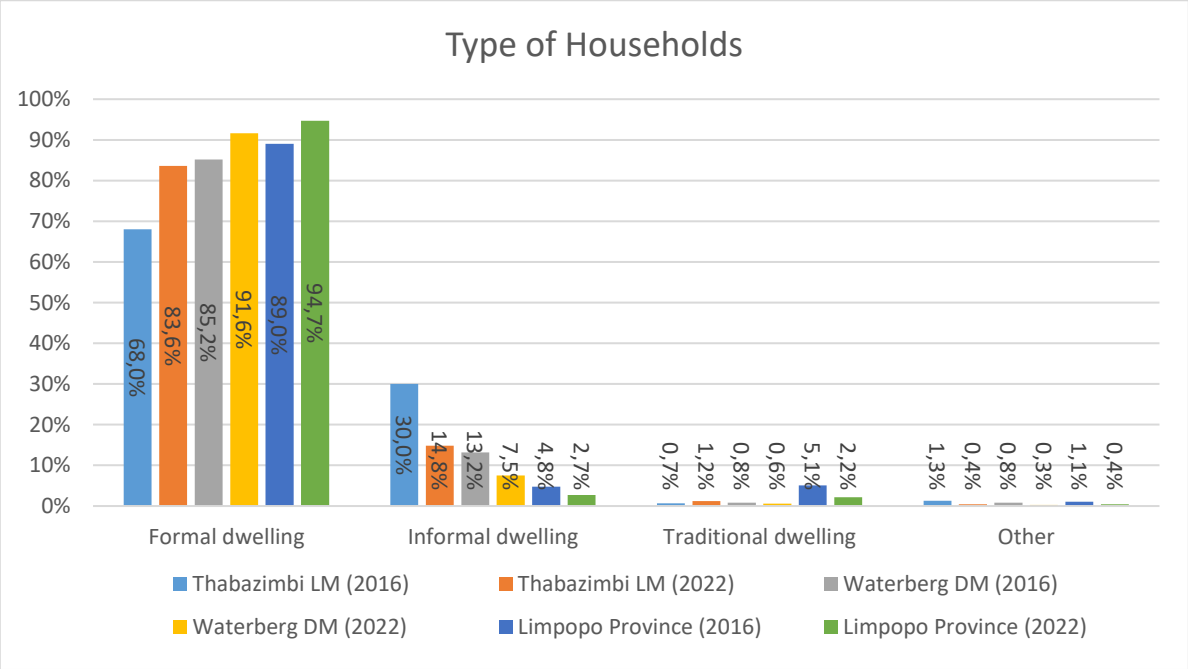

Figure 4.22: Households by type of dwelling in the Limpopo Province, Waterberg DM Thabazimbi LM (Community Survey 2016 and Census 2022)

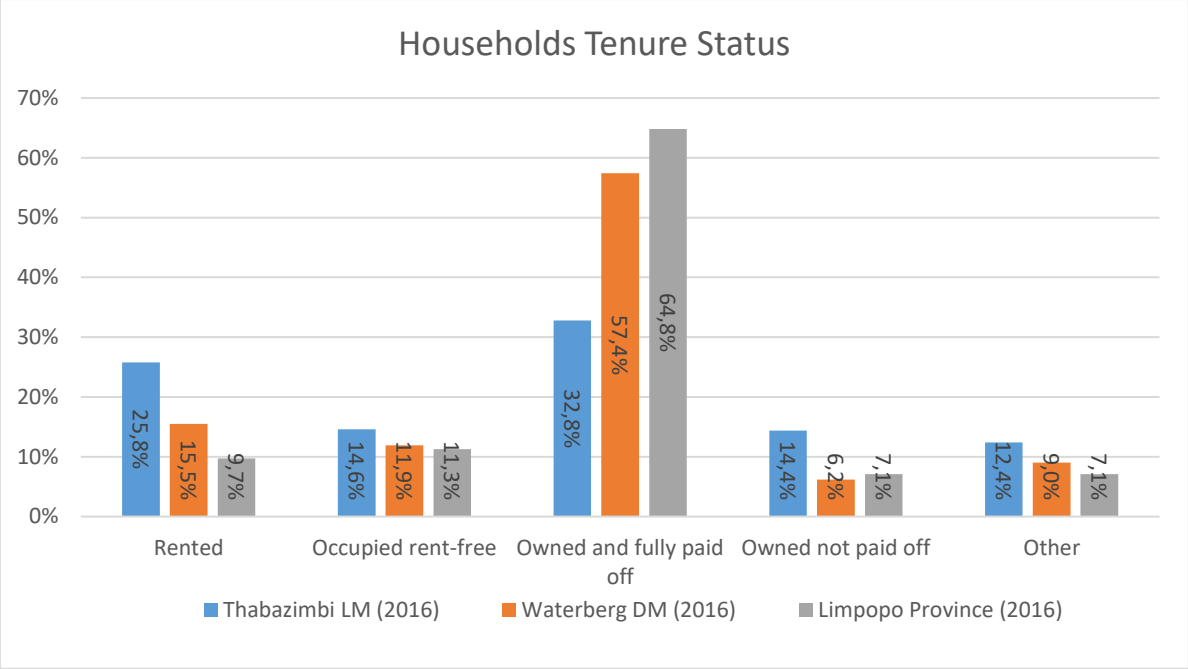

Figure 4.23: Households by tenure status in the Limpopo Province, Waterberg DM and Thabazimbi LM (Census 2011 and Community Survey 2016)

4.6.14. Access to Basic Services

Basic services such as electricity, water and sanitation, and refuse and waste removal are considered critical for the improvement of people's quality of life, and adequate supplies of basic services are also necessary to ensure life, well-being, and human dignity (Stats SA, 2017). Individuals' rights to basic services are largely enshrined in Section 24 of the Constitution, which states that everyone has the right to an environment that is not harmful to their health or well-being. The accessibility of basic services is closely related to social inclusion and social capital, and the failure of municipalities to deliver services can have a detrimental impact on social and economic development (IDASA, 2010 in Stats SA, 2017).

In terms of Section 73 of the Local Government Municipal Systems Act (No. 32 of 2000), municipalities have a general duty to give effect to the provisions of the Constitution and give priority to the basic needs of the local community, promote the development of the local community, and ensure that all members of the local community have access to at least the minimum level of basic municipal services. In addition, municipal services must be equitable and accessible, be provided in a manner that is conducive to the prudent, economic, efficient and effective use of available resources, and the improvement of standards of quality over time, be financially sustainable, be environmentally sustainable, and be regularly reviewed with a view to upgrading, extension and improvement. **Table 4.2** provides the classification of infrastructure quality and different levels of service provision developed by Statistics South Africa following World Bank studies (Stats SA, 2017). The table is used as a reference point of basic infrastructure, as the classifications have undergone changes and different classifications throughout each Census data collection.

Table 4.2: Classification of infrastructure quality (Stats SA, 2017)

Service Level	Water	Sanitation	Solid Waste	Electricity
None	No access to piped water.	No sanitation.	No facilities/dump anywhere	No access to electricity
Minimal	Communal standpipe >200m.	Bucket toilets.	Communal/own refuse dump.	Generator/solar
Basic	Communal standpipe <200m	Pit toilet without ventilation pipe.	Communal container/collection point	Access to electricity don't pay for
Intermediate	Piped water in the yard.	Ventilated Improved Pit (VIP) latrine toilet, Chemical, or ecological toilets.	Removed less than once per week.	Connected to source and paid for
Full	Piped water in dwelling	Conventual waterborne	Removed once per week	In-house pre- and post-paid meters.

Access to basic services is assessed at a household level. An overview of households within the Limpopo Province, Waterberg DM and Thabazimbi LM access to basic services is described in the following sub-section.

4.6.14.1. Access to Water Supply

South Africa's policy frameworks for basic services are aimed at the rights of all citizens to basic services, including access to water and sanitation, energy and waste services. South Africa has set itself a target of achieving access to improved drinking water services for all its citizens.

According to the 2016 Community Survey, it was found that 53.7% of households in the Thabazimbi LM had access to safe drinking water, which was lower than the Waterberg DM's 78.1% and the Limpopo Province's 76.7%. Access to safe drinking water is crucial in the region and needs further development.

The majority of households in the Thabazimbi LM (59.7%) (**Figure 4.24**) had access to piped water facilities within their homes, more than the 44.7% in the Waterberg LM households. The Thabazimbi LM and Waterberg DM had both experienced significant changes in household water supply, with more households in both regions having water supplied within their homes in 2022 compared to 2016. Both regions have seen a decrease in other water sources, with more households with piped water on communities stands as their source of water.

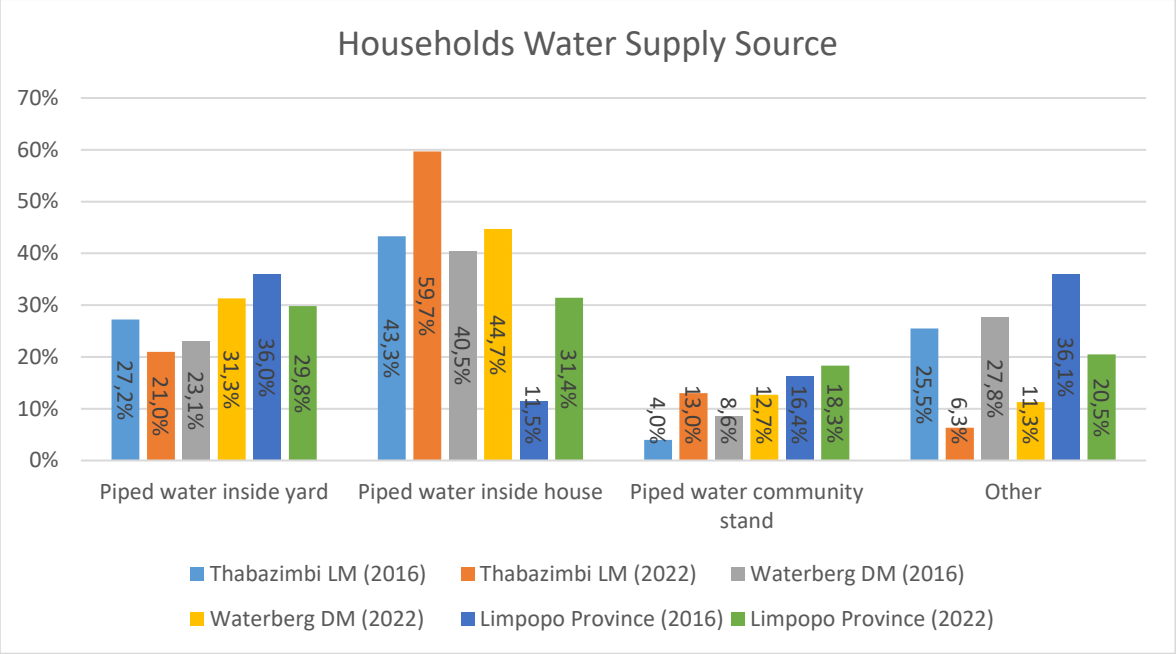

Figure 4.24: Households by their main source of water supply for the Limpopo Province, Waterberg DM and Thabazimbi LM (Community Survey 2016 and Census 2022)

4.6.14.2. Access to Sanitation

Ensuring access to basic functional sanitation services is a critical development priority for South Africa as it promotes the well-being of communities. According to the Census 2022 and Community Survey of 2016, the Thabazimbi LM and Waterberg DM majority of households had flushing toilet facilities, 77.4% in the Thabazimbi LM and 57.6% in the Waterberg DM (**Figure 4.25**). The number of pit latrines remains high at 13.4% in the Thabazimbi LM and 37.2% in Waterberg DM, although a significant decrease in both regions has been observed from 2016 to 2022.

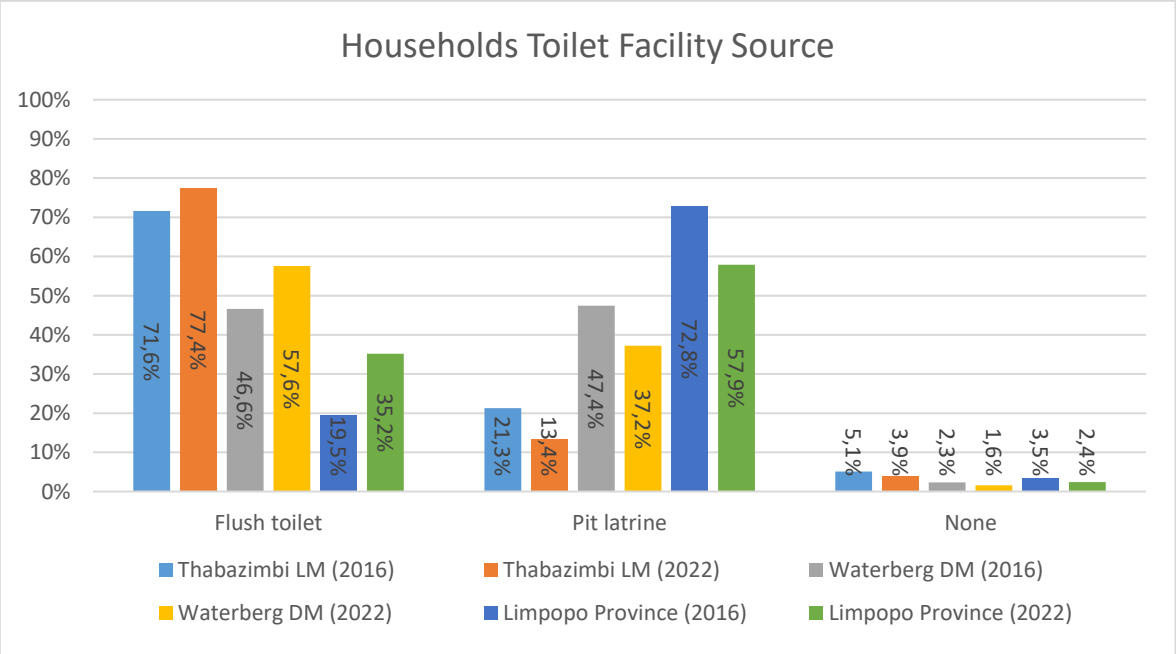

Figure 4.25: Households by main source of toilet facility for the Limpopo Province, Waterberg DM and Thabazimbi LM (Community Survey 2016 and Census 2022)

4.6.14.3. Access to Electricity

Individuals' access to different energy sources for cooking, heating, and lighting purposes is significant, as the burning of fuel sources such as wood, coal, and/or animal dung over extensive periods of time could result in negative health impacts for household members. Health impacts would be most significantly experienced by those vulnerable members of society, such as young children, pregnant women, and the elderly. Although the type of fuel source used for cooking, lighting or heating purposes might cause health risks, it is not considered in this study as the baseline of access to electricity is of greater comparison.

According to the Community Survey 2016 (**Figure 4.26**) 74.9% of households in the Thabazimbi LM and 88.9% in the Waterberg DM had access to in-house prepaid or conventional meters for electricity. Within the Thabazimbi LM, 17.1% of households reported not having access to electricity, while the Waterberg DM illustrated a lower 8.5% of households without electricity. Some households in the Thabazimbi LM and Waterberg DM obtained their electricity from sources not paid for.

The Census 2022 data review of electricity supply is conducted in a different manner from 2016. In the Thabazimbi LM (**Figure 4.27** and **Figure 4.28**), 58.4% of households used electricity as their main source for cooking and 89.3% for lighting in their households. The ratios for the Waterberg DM were 52.1% for cooking and 92.9% for lighting in these households. The use of gas was a common source for cooking in all three regions.

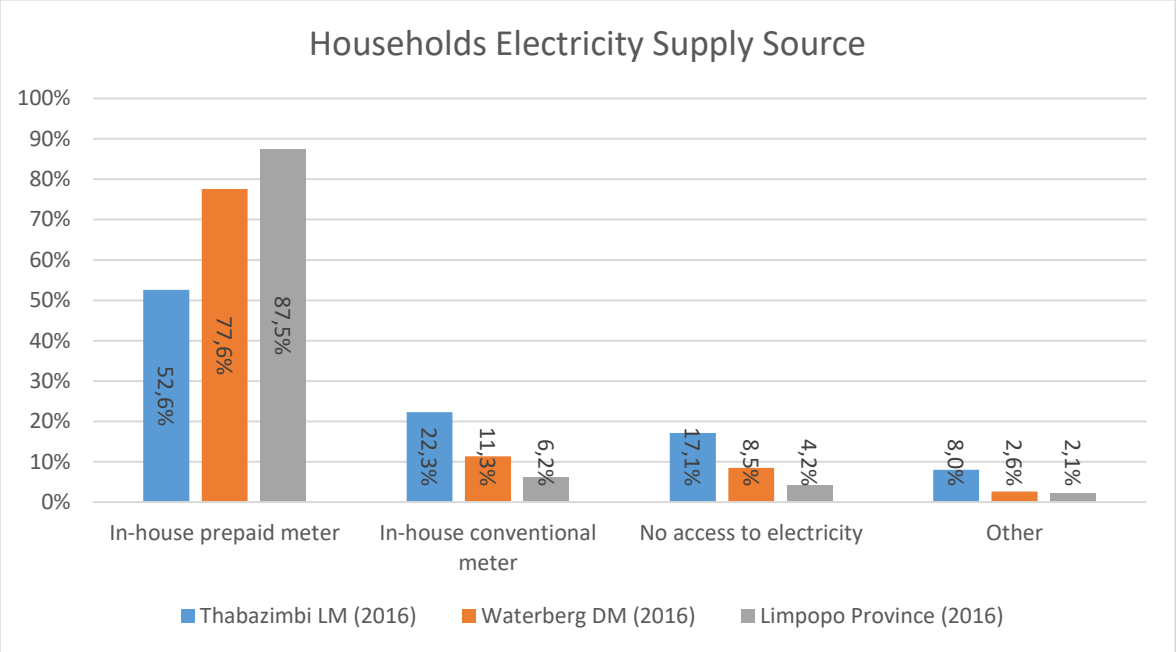

Figure 4.26: Energy sources for households in the Limpopo Province, Waterberg DM and Thabazimbi LM (Community Survey 2016)

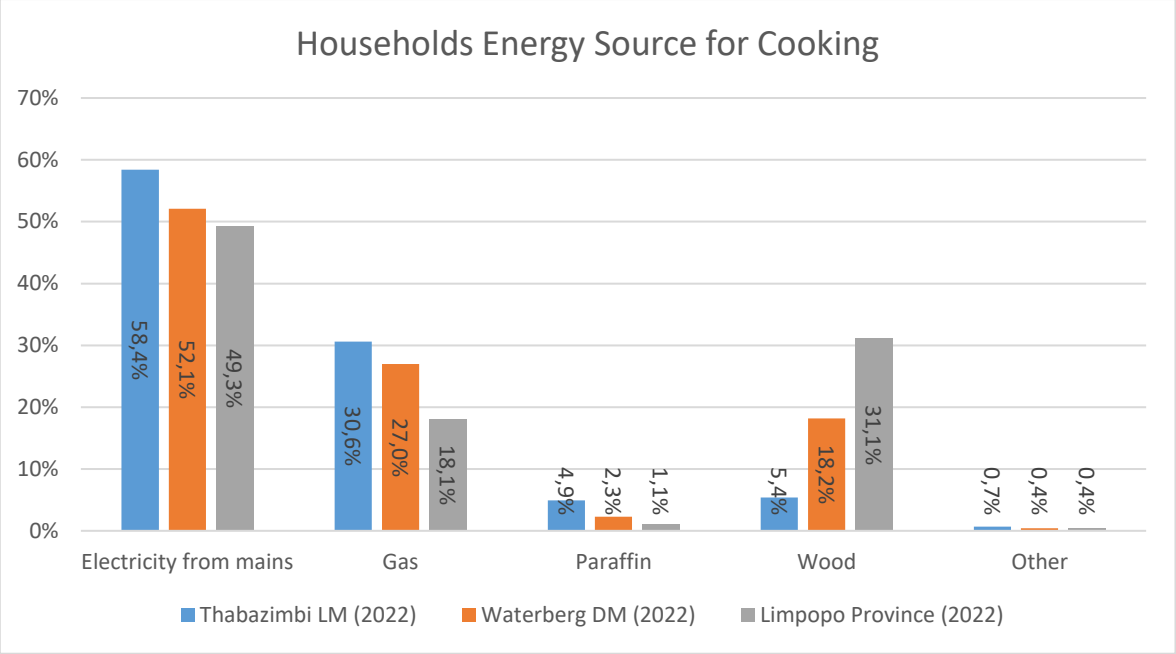

Figure 4.27: Energy sources for cooking in the Limpopo Province, Waterberg DM and Thabazimbi LM (Census 2022)

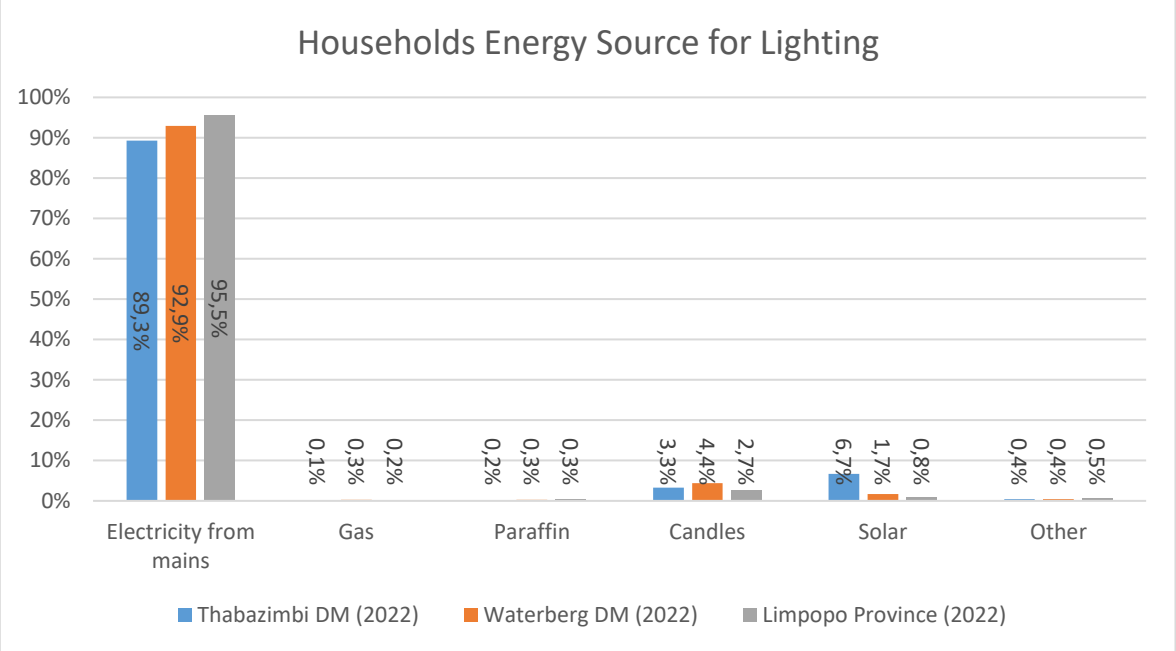

Figure 4.28: Energy sources for lighting in the Limpopo Province, Waterberg DM and Thabazimbi LM (Census 2022)

4.6.14.4. Access to Refuse Removal

In 2022, the majority of households in Thabazimbi LM and Waterberg DM had access to regular refuse removal through a service provider (**Figure 4.29**). The Thabazimbi LM and Waterberg DM both saw an increase in regular refuse removal and a decrease in their own dumping facilities. The Thabazimbi LM regular refuse removal increased from 46.6% in 2016 to 69.2% in 2022, with the households in the Waterberg DM increasing from 43.9% to 52.6%.

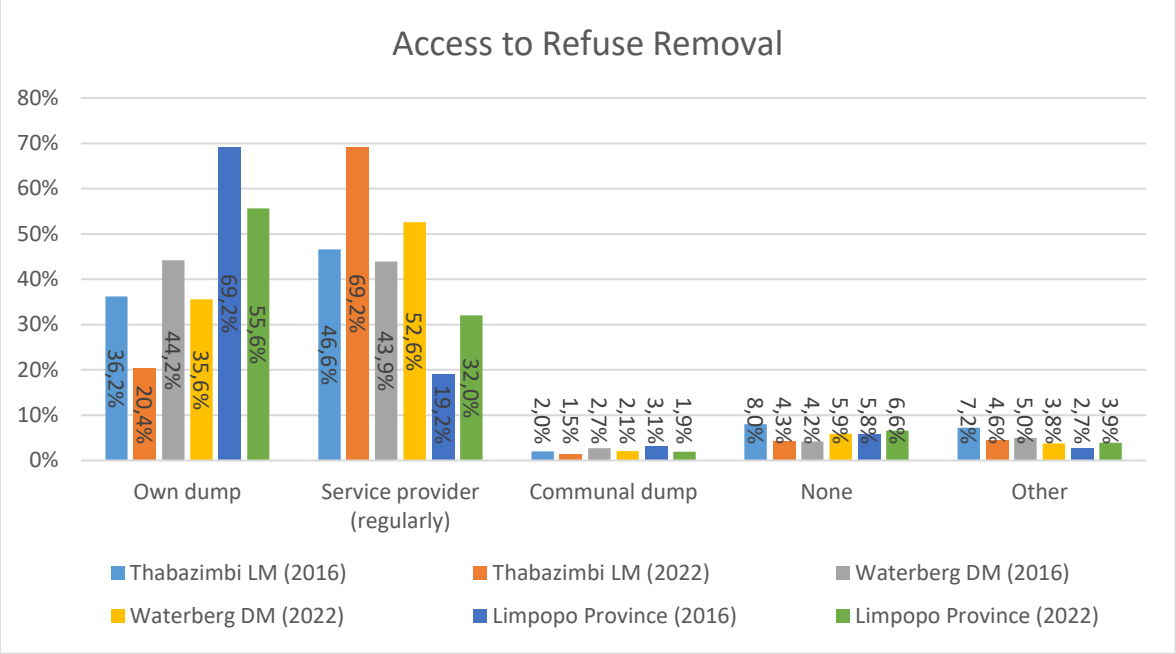

Figure 4.29: Access to refuse removal for Limpopo Province, Waterberg DM and Thabazimbi LM (Community Survey 2016 and Census 2022)

4.7. Baseline Summary

In summary, the area was found to have the following socio-economic characteristics:

- According to the Census 2022 and Community Survey 2016, South Africa, the Limpopo Province and the Waterberg DM experienced an increase in population, while the Thabazimbi LM experienced a decrease. The Waterberg DM population increased by 2.3% or 17 103 people to 762 862 people in 2022, compared to the Thabazimbi LM, which experienced a 32.4% or 31 185 decrease in population with a total of 65 047 people in 2022.
- Black Africans were the majority population group in the Thabazimbi LM (76.2%), Waterberg DM (90.2%) and Limpopo Province (96.5%). The second highest distribution population group in all the regions were the white population group.
- The gender profile of South Africa, the Limpopo Province and the Waterberg DM were female-skewed, while the gender distribution for Thabazimbi LM was male-skewed. The male-skewed distribution may be due to the mining sector as a main employment contributor within the region.
- The Thabazimbi LM and Waterberg DM had similar population pyramids, characterised by a wide base and narrowing before widening within the middle section, before narrowing towards the top. This is a characteristic of a changing population growth and instability.
- Between 2016 and 2022, the Thabazimbi LM and Waterberg DM had different population pyramids. The Waterberg DM illustrates a wide base narrowing towards the top, although with a greater distribution among 25 to 34 age groups, while the Thabazimbi LM illustrates a narrow base widening towards the middle age groups before narrowing towards the top. The Waterberg DM population pyramid illustrates a population that is slowly growing, although a decrease in growth has been observed in the younger age groups. The Thabazimbi LM illustrates a population that has experienced a significant decrease in its population, with a significant decrease in its younger population groups.

- The Thabazimbi LM and Waterberg DM have both experienced a decrease in the proportion of the population under 15 years of age from 2016 to 2022. On the other spectrum, both the Thabazimbi LM and Waterberg DM experienced growth in their elderly population. Both regions' dependency decreased from 2016 to 2022, with the dependency of the Thabazimbi LM standing at 35.3% and the Waterberg DM at 55.3%
- The Thabazimbi LM and Waterberg DM have seen similar educational trends; both regions have seen an increase in their matric completion ratios, although both the Thabazimbi LM and Waterberg DM have seen a slight increase in their no schooling ratio. Although there is improvement in education levels in both regions, a significant portion of their population over the age of 20 still only completed some secondary educational levels.
- According to the Census 2011, over half of the Thabazimbi LM working age (50.5%) were employed, while the Waterberg DM and Limpopo Province had lower employment ratios of 38.4% and 27.4%. The dependency on pensions and social grants in the Thabazimbi LM is significantly high, with 34.4% of the population not economically active and 13.1% unemployed.
- The majority (21.4%) of the households in the Thabazimbi LM earn an income between R40 000 and R75 000 per annum, which is higher than the Waterberg DM (14.0%) between R40 000 and R75 000 per annum. The majority of households in the Waterberg DM earned an annual income between R20 000 and R40 000. The ratio of households in both the Thabazimbi LM (14.8%) and Waterberg DM (13.9%) who earn no annual income remains high.
- According to the Thabazimbi LM IDP (2024), the local economy is driven by mining, agriculture, farming, and hunting, though agriculture is declining, threatening jobs. Horticulture remains minimal, tourism is adequate, and the Waterberg Biosphere's recognition offers marketing opportunities. Commercial, retail, and manufacturing contribute little, but the Thabazimbi Investment Initiative aims to boost economic growth.
- According to the Thabazimbi LM IDP (2024), the region has 18 healthcare facilities, but clinic shortages and limited operating hours persist. An inactive HIV/AIDS Council and a lack of counsellors worsen the disease's impact, leading to child-headed families and a shrinking workforce. With no hospice, hospitals face added strain, while a lack of accommodation contributes to high staff turnover, requiring urgent attention.
- According to the South African Police Service Annual Crime Statistics, Limpopo Province, Waterberg DM and Thabazimbi LM, experienced an increase in the number of crimes reported (classified under the 17 most commonly reported crimes). The Thabazimbi LM reported 2 359 crimes in 2024, under a quarter of the crimes within the Waterberg DM.

- The Benya Solar PV Facility is located within the Limpopo Province, with the tourism sector regarded as a significant economic contributor within the region. Within a 10km radius of the proposed development, two private nature reserves are located, the Weltevrede Private Nature Reserve and the Doornlaagte Private Nature Reserve. The nature reserves include land that has been transformed for crop cultivation, although there is some lodging facilities located within the Weltevrede Private Nature Reserve boundary. The majority of these lodging facilities may provide accommodation for hunters visiting the region.
- The majority of households in the Thabazimbi LM (83.6%) and Waterberg DM (91.6%) were reported to reside in formal dwellings, with the proportion of informal dwellings in both

regions decreasing from 2016 towards 2022. The majority of households in the Thabazimbi LM and Waterberg DM were owned and fully paid off.

- According to the 2016 Community Survey, it was found that 53.7% of households in the Thabazimbi LM had access to safe drinking water, which was lower than the Waterberg DM's 78.1% and the Limpopo Province's 76.7%. Access to safe drinking water is crucial in the region and needs further development.
- Over half of the households in the Thabazimbi LM (59.7%) and under half in the Waterberg DM (44.7%) had piped water facilities within their homes. Both regions have seen a rise in piped water facilities within their homes and a decrease in water supplied by other sources.
- Flushing toilet facilities were the most common sanitation facility in the Thabazimbi LM (77.4%) and Waterberg DM (57.6%). Additionally, both regions have seen a significant decline in pit latrines. However, the number of pit latrines remains high in 2022, although it is not the majority as in 2016, as it was in the Waterberg DM.
- The proportion of households with no access to electricity was lower in the Waterberg DM at 8.5% than in the Thabazimbi LM, where 17.1% of households reported no access to electricity. The majority of households in the Thabazimbi LM (74.9%) and Waterberg DM (88.9%) had access to electricity either through prepaid or conventional meters.
- The majority of households in both regions made use of electricity for their cooking and lighting sources, although a mention can be made of the use of gas as a source of energy for cooking in all three regions.
- The Thabazimbi LM and Waterberg DM both saw an increase in regular refuse removal and a decrease in their own dumping facilities. The Thabazimbi LM regular refuse removal increased from 46.6% in 2016 to 69.2% in 2022, with the households in the Waterberg DM increasing from 43.9% to 52.6%.

5. STAKEHOLDER ENGAGEMENT

To identify and understand potential social impacts, landowners, surrounding landowners, and key stakeholders, e.g., business owners located in the surrounding town, should be engaged via interviews. The interviews should follow a semi-structured interview to obtain the interviewees' respective views on the proposed development. **Figure 5.1** Illustrate adjacent properties that should form part of the stakeholder engagement process.

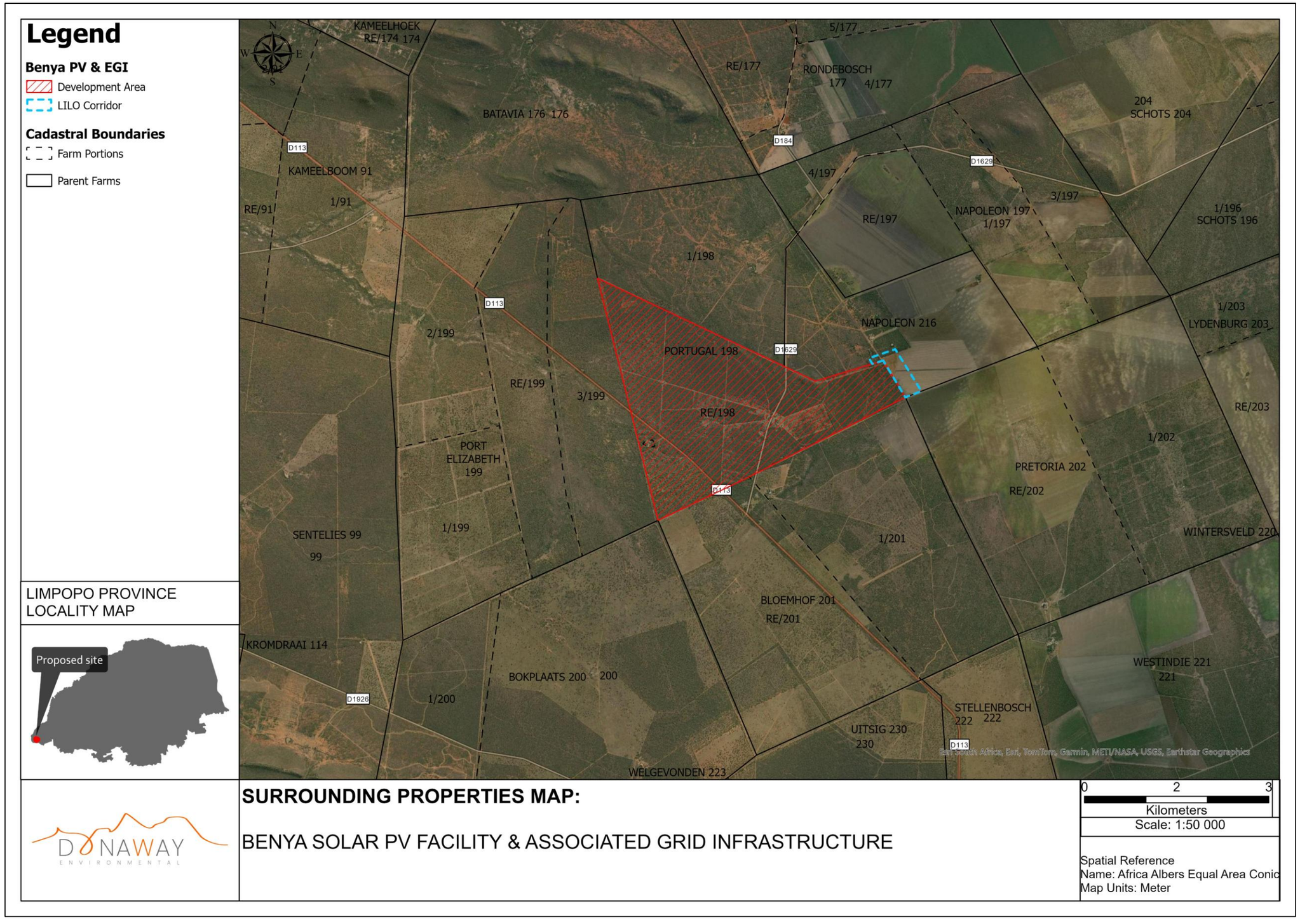

Figure 5.1: Map of the surrounding properties of the Remaining Extent of Farm Portugal No. 198 and Farm Napoleon 216

6. GUIDE TO UTILITY-SCALE SOLAR POWER PLANTS

The International Finance Corporation (IFC) has published a Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants. Section 8 of the Project Developer's Guide pertains to Permits, Licensing and Environmental Considerations, and states that in order to deliver a project which will be acceptable to international lending institutions, environmental and social assessments should be carried out in accordance with the requirements of the key international standards and principles, namely the Equator Principles and IFC's Performance Standards (IFC PS).

Some of the key environmental considerations for PV facilities contained within the Project Developer's Guide are provided below:

6.1. Construction Phase Impacts

Construction activities lead to temporary air emissions (dust and vehicle emissions), noise related to excavation, construction and vehicle transit, solid waste generation and wastewater generation from temporary building sites and worker accommodation. In addition, Occupational Health and Safety (OHS) is an issue that needs to be effectively managed during construction in order to minimise the risk of preventable accidents leading to injuries and/or fatalities. Proper OHS risk identification and management measures should be incorporated in every project's management plan and standard Engineering, Procurement and Construction (EPC) contractual clauses.

6.2. Water Usage

Adequate provision of water will be a prerequisite for the development. Water for the proposed development will most likely be obtained from groundwater resources, or alternatively from the local municipality. Water will be needed during the construction and operational phases of the project. Most of the usage during the operational phase is for the cleaning of the solar panels.

6.3. Land Matters

As solar power is one of the most land-intensive power generation technologies, land acquisition procedures and in particular the avoidance or proper mitigation of involuntary land acquisition/resettlement are critical to the success of the project. This includes land acquired either temporarily or permanently for the project site itself and any associated infrastructure – i.e., access roads, powerlines, construction camps (if any) and switchyards. No involuntary land acquisition is foreseen for the purpose of this project, in the case where involuntary land acquisition is unavoidable, a Resettlement Action Plan (RAP) (dealing with physical displacement and any associated economic displacement) or Livelihood Restoration Plan (LRP) (dealing with economic displacement only) will be required. This is often a crucial issue with respect to local social license to operate and needs to be handled with due care and attention by suitably qualified persons.

6.4. Landscape and Visual Impacts

Key impacts can include the visibility of the solar panels within the wider landscape and associated impacts on landscape designations, character types and surrounding communities. Common mitigation measures to reduce impacts can include consideration of layout, size and scale during the design process and landscaping/planting in order to screen the modules from surrounding receptors.

Note that it is important that the impact of shading on energy yield is considered for any new planting requirements. Solar panels are designed to absorb, not reflect, irradiation. However, glint and glare should be a consideration in the environmental assessment process to account for potential impacts on landscape/visual and aviation aspects. A standalone Visual Impact Assessment was conducted.

6.5. Ecology and Natural Resources

Potential impacts on ecology can include habitat loss/fragmentation, impacts on designated areas and disturbance or displacement of protected or vulnerable species. Receptors of key consideration are likely to include nationally and internationally important sites for wildlife and protected species such as bats, breeding birds and reptiles. A standalone Terrestrial Biodiversity Impact Assessment was conducted.

6.6. Cultural Heritage

Potential impacts on cultural heritage can include impacts on the setting of designated sites or direct impacts on below-ground archaeological deposits as a result of ground disturbance during construction. A standalone Heritage Impact Assessment was conducted.

6.7. Tourism

Potential impacts on tourism might be positive and negative. Tourism or lodging facilities in an area might benefit from contractors or employees lodging at these facilities. Furthermore, tourists might see renewable energy facilities as positive or interesting, setting aside some time to visit these facilities when in the area. Some tourism facilities might see renewable energy development as negative in terms of visual impact, concerned that these developments might cause a financial loss due to lower interest from tourists. Mitigation may include proper screening of the facility to reduce the visual impact towards a tourist facility.

6.8. Transport and Access

The impacts of transportation of materials and personnel should be assessed in order to identify the most appropriate transport route to the site while minimising the impacts on project-affected communities. The requirement for any oversized vehicles / abnormal loads should be considered to ensure access is appropriate. Onsite access tracks should be permeable and developed to minimise disturbance to agricultural land. Where project construction traffic has to traverse local communities, traffic management plans should be incorporated into the environmental and social management plan and EPC requirements for the project. A standalone Traffic Impact Assessment was conducted.

6.9. Drainage/Flooding

A review of flood risk should be undertaken to determine if there are any areas of high flood risk associated with the site. Existing and new drainage should also be considered to ensure run-off is controlled to minimise erosion. A standalone Aquatic Biodiversity assessment was conducted.

6.10. Consultation and Disclosure

It is recommended that early-stage consultation is sought with key authorities, statutory bodies, affected communities and other relevant stakeholders. This is valuable in the assessment of project

viability and may guide and increase the efficiency of the development process. Early consultation can also inform the design process to minimise potential environmental impacts and maintain overall sustainability of the project. The authorities, statutory bodies and stakeholders that should be consulted vary from country to country but usually include the following organisation types:

- Local and / or regional consenting authority.
- Government energy department / ministry.
- Environmental agencies / departments.
- Archaeological agencies / departments.
- Civil aviation authorities / Ministry of Defence (if located near an airport).
- Road's authority.
- Health and safety agencies / departments.
- Electricity utilities.
- Military authorities.

Community engagement is an important part of project development and should be an on-going process involving the disclosure of information to project-affected communities. The purpose of community engagement is to build and maintain over time a constructive relationship with communities located in close proximity to the project and to identify and mitigate the key impacts on project-affected communities. The nature and frequency of community engagement should reflect the project's risks to, and adverse impacts on, the affected communities.

6.11. Environmental Management Programme (EMPr)

Whether or not an EIA has been completed for the site, an EMPr should be compiled to ensure that mitigation measures for relevant impacts of the type identified above (and any others) are identified and incorporated into project construction procedures and contracts. Mitigation measures may include, for example, dust suppression during construction, safety induction, training and monitoring programs for workers, traffic management measures where routes traverse local communities, implementation of proper waste management procedures, introduction of periodic community engagement activities, implementation of chance find procedures for cultural heritage, erosion control measures, fencing off any vulnerable or threatened flora species, etc. The EMPr should indicate who will be responsible for implementing each action, and how this will be monitored and reported on at the project level. The plan should be in line with the nature and type of impacts identified.

The associated social impacts mentioned by Vanclay (2003) included in Section 2.1 and listed above may overlap within certain impacts and may affect more than one category at a time. Social impacts are expected to occur during the construction, operational and decommissioning phases of the project.

The impacts associated with the proposed development are described and assessed in Section 7, along with mitigation and enhancement measures to reduce or eliminate negative impacts and enhance positive impacts. Impacts associated with the decommissioning phase are fairly similar to the impacts during the construction phase and therefore will not be assessed in detail.

7. KEY SOCIAL CONSIDERATIONS

Understanding the IFC has Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants and how it connects with the social impacts on the project area is of importance to define the impacts associated with the proposed Benya Solar PV Facility. According to Vanclay (Vanclay, 2003) seven main categories of social considerations should be considered in development. The seven categories are as follows:

- Impacts associated with health and social well-being.
- Impacts associated with the quality of the living environment.
- Impacts associated with the economic aspect.
- Impacts associated with the cultural aspect.
- Impacts on families and communities.
- Impacts associated with institutional, legal, political and equity
- Impacts associated with gender relations.

7.1. Impacts Associated with Health and Social Well-Being

The proposed Benya Solar PV Facility is associated with health and well-being impacts such as the potential or fear of an increase in crime, increased nuisance-associated impacts, increased risk of wildfires, impact on the sense of place, and health implications. Each of these health and social well-being-related impacts is discussed below:

7.1.1. Potential or Fear of an Increase in Crime

The commencement of construction activities can be associated with an increase in crime within an area. The perceived loss of security during the construction phase of a project due to an influx of workers and/or outsiders to the area (as in-migration of newcomers, construction workers or jobseekers are usually associated with an increase in crime), may have indirect effects such as increased safety and security concerns for neighbouring properties, damage to property, increased risk of wildfires, stock theft, poaching, crime and so forth. The remoteness of the surrounding region, with farmsteads, spread out due to the agricultural landscape, may lead to a psychological effect on some people who will feel their safety is at risk. Knowledge of a project in the area may also lead to jobseekers in the area, and if unsuccessful, they may turn to crime as a source of income.

Given the fact that a man camp will not be established on-site, and the labour force will therefore not permanently reside within the area, or have any reason to be onsite after hours, it is anticipated that the probability and significance of such safety and security impacts occurring will be reduced. Once the construction phase is complete, the number of personnel on the property will be significantly reduced, with only operational and maintenance personnel operating on the site. In addition, security and security cameras are likely to be included in the development. After the Construction Phase is finished, the number of construction workers on-site will decrease significantly, with only maintenance activities ongoing. Once the site becomes operational, concerns are likely to diminish.

7.1.2. Increased Nuisance-Associated Impacts

Impacts associated with construction-related activities include noise, dust, and possible disruption to adjacent properties, specifically with construction-related noise not associated with the agricultural landscape. Site clearing activities increase the risk of dust and noise being generated, which can in turn negatively impact adjacent properties. The primary source of noise during construction would be from construction equipment, vehicle/truck traffic, and ground vibration. Noise levels can be audible over a large distance, however, are generally of short duration. Dust would be generated from construction activities as well as trucks/vehicles driving on gravel access roads. This impact will negatively impact sensitive receptors and could also potentially negatively impact surrounding land users.

7.1.3. Increased Risk of Wildfires

During the construction phase, there is an increased risk of wildfires due to the presence of construction-related activities as well as the presence of construction workers on site. The risk of wildfires poses further threats to the loss of livestock and farmsteads in the surrounding area if a possible wildfire is not contained within the project area. This could result in the loss or damage of farm infrastructure and threaten human lives. The risk of wildfires will diminish with the conclusion of the construction phase as fewer people will be on-site and more diligent methods will be in place to reduce the likelihood of a wildfire occurring.

7.1.4. Impact on Sense of Place

An area's sense of place is created through the interaction of various characteristics of the environment, including atmosphere, visual resources, aesthetics, climate, lifestyle, culture, and heritage. An area's sense of place is, however, subjective and largely dependent on the demographics of the population residing within the area and their perceptions regarding trade-offs. For example, while some individuals may prefer not to see any form of infrastructure development, others may have an interest in large-scale infrastructure, or engineering projects, and the operation of such facilities, and consider the impact to be less significant. Such a scenario may especially be true given that the project comprises a Renewable Energy project and could therefore be seen as benefitting the local environment when compared to non-renewable energy generation projects.

Intrusion impacts such as aesthetic pollution (i.e., building materials, construction vehicles, etc.), noise and light pollution, and impacts on the rural nature of the site will impact the "sense of place" for the local community. Construction-related activities have the potential to negatively impact a local area's "sense of place". The alteration of the sense of place in view of the residents and road users will start during the construction phase and remain for the project's operational lifetime, with visual intrusion as the main contributor during the operational phase of the project. The impact on the sense of place should be considered in terms of the current natural and agricultural landscape in which the Benya Solar PV Facility and grid connection infrastructure is proposed, although the surrounding vegetation cover may reduce the visual intrusion.

A standalone Visual Impact Assessment has been undertaken as part of the EIA process. However, the concept of visual intrusion is still considered from a social perspective as it has the potential to affect the community.

7.1.5. Health Implications

With a resident workforce and a potential influx of job seekers during the construction phase, the risk of HIV/AIDS transmission may increase. Additionally, the use of heavy machinery and equipment on-site poses a significant risk of injury or fatal accidents for construction workers. An increase in traffic on farm roads, combined with potential reckless driving, raises the likelihood of vehicle accidents. Furthermore, dust generated by construction activities could lead to respiratory health issues, such as silicosis. However, these risks can largely be mitigated through awareness programs, safety measures, and dust suppression strategies.

7.2. Impacts Associated with the Quality of the Living Environment

The proposed Benya Solar PV Facility is associated with impacts associated with the quality of the living environment through the disruption of daily living and movement patterns, increased stress on existing infrastructure, improvement of national energy supply and stability, and impact on the sense of place. Each of these qualities of the living environment associated impacts is discussed below:

7.2.1. Disruption of Daily Living and Movement Patterns

Project components and equipment will be transported to the site using road transport. The existing D113 and D1629 district roads Northam provide the primary access to the area. Traffic utilising the road is mainly local property owners within the surrounding region, residents from local communities and people travelling to tourist attractions in the region.

Increased traffic due to construction vehicles could cause disruptions to road users, and the local community and increase safety hazards, especially on the main road that will be utilised. The use of local roads and transport systems may cause road deterioration and congestion. An increase in traffic from the rise in construction vehicles is a safety concern for other road users and local communities in the area. Noise, vibrations, dust and visual pollution from heavy vehicle traffic during the construction phase could also negatively impact local residents and road users.

7.2.2. Increased Stress on Existing Infrastructure

The road infrastructure in the Limpopo Province and surrounding areas of the proposed development site is in poor condition and continues to deteriorate. The increase in vehicular traffic, especially from construction vehicles, will further strain the roads. Gravel access roads leading to the site are especially vulnerable and are also used by local farmers.

7.2.3. Improvement of National Energy Supply and Stability

South Africa currently relies predominantly on coal-generated electricity to meet its energy needs. As a result, the country's carbon emissions are considerably higher than those of most developed countries partly because of the energy-intensive sectors which rely heavily on low-quality coal, which is the main contributor to Greenhouse Gas (GHG) emissions. The use of solar technology for power generation is considered a non-consumptive use of a natural resource which produces zero GHG emissions during its operation. The generation of RE utilising solar power will contribute positively to South Africa's electricity market. Given South Africa's reliance on Eskom as a power utility, the benefits

associated with a REIPPP Programme are regarded as an important contribution, and the advancement of RE has been identified as a priority for South Africa.

Increasing the contribution of the RE sector to the local economy would contribute to the diversification of the local economy and provide greater economic stability. The growth in the RE sector as a whole could introduce new skills and development into the area. This is especially true with regards to solar power specifically considering the number of other solar power projects proposed within the broader area.

The development of RE projects has the potential to contribute to the stability of the economy and could contribute to the local economy through employment generation (direct, indirect, and local service providers) and revenue generation. While the overall contribution of the project to South Africa's total energy requirements is small, the facility will also contribute towards offsetting the total carbon emissions associated with energy generation in South Africa. It should however be noted that such a benefit is associated with all RE projects and not only solar power projects.

7.2.4. Impact on Sense of Place

As described in Section 7.1.4 the site is situated in an agricultural region with the possibility of vegetation cover reducing the visual intrusion and affecting the sense of place of the region. It will have an impact not only on the health and social well-being of the region but also on the quality of the living environment.

7.3. Impacts Associated with the Economic Aspect

The proposed Benya Solar PV Facility is associated with impacts associated with the economic aspect of the region through the creation of employment opportunities and skills development, increased opportunities for local businesses and service providers, contribution to the Local Economic Development (LED) and social upliftment, decrease in the surrounding regions tourism potential, increased potential of livestock theft or property vandalization and loss of productive farmland. Each of these qualities of the economic aspect associated impacts is discussed below:

7.3.1. Creation of Employment Opportunities and Skills Development

It is anticipated that at its peak; the construction of the proposed project will result in the creation of employment opportunities. Of those employment opportunities likely to be generated, they will accrue to low-skilled workers, semiskilled workers, and to skilled workers. Employment opportunities generated as a result of the project will be temporary in nature and will last for the duration of the construction period, while the skills developed through experience in the construction of the project will be retained by the community members involved. The project proponent anticipates that most of the general labour force will as far as possible, be sourced from the local labour pool. Where relevant skills are unavailable from the local labour pool, these would need to be sought elsewhere. Solar PV projects make use of large numbers of unskilled and semi-skilled labour, so there will be a good opportunity to use local labour. The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area.

It is anticipated that the operational phase of the project is likely to create work opportunities. Maintenance activities will be carried out throughout the lifespan of the project and will include

washing of solar panels, vegetation control, and general maintenance around the solar energy facility. The employment opportunities generated as a result of the project will be long-term and will last for the duration of the operation. None of the employment opportunities will be permanently stationed onsite. In addition to the direct employment opportunities, it is anticipated that additional indirect employment opportunities will be generated during the operation of the project.

7.3.2. Increased Opportunities for Local Businesses and Service Providers

There are likely to be opportunities for local businesses and service providers to provide services and materials for the construction phase of the proposed project. The economic multiplier effects from the use of local goods and services will include, but are not limited to, the provision of construction materials and equipment, and workforce essentials such as catering services, trade clothing, safety equipment, ablution, accommodation, transportation and other goods. In addition, off-site accommodation may be required in the nearby towns for contract workers and certain employees. The increase in demand for goods and services may stimulate local businesses and local economic development (however, locally sourced materials and services may be limited due to availability). There is likely to be a direct increase in industry and an indirect increase in secondary businesses.

In terms of business opportunities for local companies, expenditure during the construction phase will create business opportunities for the regional and local economy. The increase in demand for new materials and services in the nearby area may stimulate local businesses and local economic development. There is likely to be a direct increase in industry and an indirect increase in secondary businesses. The project proponent should source services needed from the local area as much as possible. These necessities should be sourced from nearby towns and local service providers. Potential opportunities for local economies, a decrease in the current level of unemployment, and an increase in incomes will in turn stimulate further expenditure and sales within the local economies.

The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area. Through the stimulation of employment and income, new demand may be created within local and regional economies. With increased income comes additional income for expenditure on goods and services supplied. Indirect impacts would occur as a result of the new economic development and would include new jobs at businesses that may support the construction workforce or provide project materials, and associated income. The intention should therefore be to maximise local labour employment opportunities, which is likely to have a positive impact on local communities and downstream benefits with regards to household income, education and other social aspects. Such benefits may however be limited given the short construction period.

7.3.3. Contribution to the Local Economic Development and Social Upliftment

Projects which form part of the DMRE's REIPPP Programme are required, as part of their bidding requirements, to contribute towards LED and social upliftment initiatives within the area in which they are proposed. In addition, they are required to spend a percentage of their revenue on socio-economic and enterprise development, as well as allocate ownership shares to local communities that benefit previously disadvantaged communities around the project. A portion of the dividends generated by each development also needs to be invested in LED projects and programmes. The proposed development therefore has the potential to contribute positively towards socio-economic development and improvements within the local area.

Socio-economic spin-offs from the proposed development could therefore contribute towards better infrastructure provision and investment in education and skills development. An in-depth Community Needs Assessment (CNA) is required to ensure that the beneficiary community's needs are understood and sufficiently addressed by the proposed development programmes in order to contribute meaningfully towards local economic growth and development. It should be noted however that such a benefit would be associated with all RE projects and not just solar power projects in particular.

7.3.4. Decrease in the Surrounding Regions Tourism Potential

Disruptions to the area's sense of place are likely to reduce its potential for tourism activities that depend on the rural ambience characteristic of the environment. Game farming is a key activity in the surrounding area. Wildlife resorts and hunting farms rely on a "rural feel" (i.e., being far from urban centres), and industrial infrastructure contradicts this. If the sense of place is compromised, the appeal of nearby game farms as safari and/or hunting destinations, especially to international tourists, will be significantly diminished, leading to potential income loss and job cuts.

7.3.5. Increased Potential of Livestock Theft or Property Vandalism

As described in Section 7.1.1 the possibility of an increase in crime due to job seekers turning to crime as a potential source of income or vandalism as a method of distribution due to no employment opportunities provided by the facility. Additionally, the remoteness of the region and the agricultural practices may increase the likelihood of livestock theft in the region.

7.3.6. Loss of Productive Farmland

A negative impact identified for the construction phase is the loss of productive farmland. The activities associated with the construction phase may have a potential impact in terms of the loss of available farmland for grazing as well as other agricultural activities. The current land use of the identified area for the proposed Benya Solar PV Facility is used for agricultural activities, therefore the site is considered as agricultural land until it has been changed.

7.4. Impacts Associated with the Cultural Aspect

The proposed Benya Solar PV Facility is associated with impacts associated with the cultural aspect of the region through the possibility of an impact of non-local workers or job seekers on the local communities. The associated impact is discussed below:

7.4.1. Influx of Jobseekers

Construction projects have the potential to attract job seekers who may move into an area in search of employment opportunities. An influx of people looking for employment or other economic opportunities could result in increased pressure being placed on economic and social infrastructure, and a change in the local population. An influx of jobseekers into an area could lead to a temporary increase in the level of crime, cause social disruption and put pressure on basic services. This includes municipal services such as sanitation, electricity, water, waste management, health facilities, transportation and the availability of housing.

Given the relatively large labour force required for the project, the short duration of the construction period, and the proximity of the site to the towns (from which most of the labour is likely to be

sourced), the construction of the project is not anticipated to result in changes to the population within the site or its surrounds. In addition, since no man camps will be established on site, the potential for an influx of people into the area or change in population demographics is anticipated to be minimal. The labour force is therefore also not anticipated to place significant pressure on local resources and social networks, or existing services and infrastructure, as they would already be accessing services at their places of residence.

7.4.2. Impact of Non-Local Workers on the Local Communities

As mentioned in Section 7.4.1 an influx of jobseekers can have a significant impact on the communities and resources. Although, it is anticipated that the majority of the workforce will be sourced from the local communities it is not anticipated to have a significant impact on the cultural aspect of the region.

7.5. Impacts on Families and Communities

The proposed Benya Solar PV Facility is not expected to have a significant impact on the area at a family and community level. However, the potential remains due to impacts associated with health and social well-being, and impacts associated with the quality of the living environment. Each of these impacts associated with families and communities is discussed below:

7.5.1. Potential or Fear of an Increase in Crime (Families and Communities)

As discussed in Section 7.1.1 the Benya Solar PV Facility could lead to the potential or fear of an increase in crime. Families and the community will be directly affected if crime rates increase, with particularly severe consequences in the case of violent crimes. The fear of potential crime could disrupt daily life, causing concerns such as being afraid to drive farm roads at night, leading to heightened stress among community members. This impact is anticipated to be most significant during the construction phase.

7.5.2. Relocation of Farmers and Residents

If significant impacts such as loss of sense of place and increased crime were to occur, farmers and residents could become dissatisfied with their living environment. In extreme cases, some may even consider relocating, leading to shifts in family and community dynamics. However, the likelihood of this happening is low, and therefore, it has not been assessed in detail.

7.6. Impacts Associated with Institutional, Legal, Political and Equity

The proposed Benya Solar PV Facility is associated with institutional, legal, political and equity impacts therefore, considering the alignment of the Benya Solar PV Facility with national, provincial and local planning forms a significant aspect in the impact associated with the proposed Benya Solar PV Facility and the spatial planning of the region.

7.6.1. Review of National, Provincial and Local Planning

Section 3 summarises the national, provincial and local policies regarding solar energy facility developments. The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa's energy security. The Integrated Resource Plan (IRP) is a living plan that is expected to be regularly updated as necessitated by the changing circumstances. The main

purpose of the IRP is to ensure the security of electricity supply necessary by balancing supply and demand, while considering the environmental and total cost of supply. South Africa continues to pursue a diversified energy mix that will provide security of supply while ensuring compliance with its emissions reduction plan. South Africa's approach to energy security in in line with international trends and developments.

7.7. Impacts Associated with Gender Relations

Gender refers to the roles, behaviours, responsibilities, and expectations that societies attribute to individuals based on their perceived identity as male or female. These characteristics are shaped by cultural norms, traditions, and social structures, and they can vary significantly across different communities and evolve over time. Factors such as the gender of the household head, access to resources, and societal expectations further influence gender relations within a given context.

In assessing the potential implications of the proposed amendment, no direct or indirect impacts on gender relations have been identified. The amendment does not introduce changes that would alter existing gender roles, access to opportunities, or decision-making structures within households or communities. Additionally, it does not affect policies or frameworks related to gender equity, representation, or participation. As a result, a detailed gender impact assessment has not been deemed necessary.

However, it is recognized that gender dynamics are inherently linked to broader social and economic factors. Should any unforeseen gender-related implications arise during the implementation of the amendment, appropriate measures may be considered to address them in a manner that promotes inclusivity and equity.

8. SCOPING IMPACT ASSESSMENT

This section provides a detailed description and assessment of the potential social impacts that were identified during the Scoping process for the detailed design and construction, operation, and decommissioning phases of Benya Solar PV Facility.

Mitigation measures are recommended to minimise or eliminate negative impacts while enhancing positive ones. The impacts during the Decommissioning Phase will be largely similar to those in the Construction Phase. Therefore, while these impacts are discussed for the Decommissioning Phase, they have not been assessed in detail. No-go alternatives, cumulative impacts and residual impacts for each identified impact are included in a separate table for the Construction and Operational Phases.

8.1. Construction Phase Impacts Associated with the Benya Solar PV Facility

The majority of social impacts associated with the project are anticipated to occur during the construction phase and are typical of the type of social impacts associated with construction activities. Impacts associated with the design and construction phase of a project are usually of short duration and temporary in nature, but could have long-term effects on the surrounding social environment if not planned or managed appropriately. It is therefore necessary that the design phase be conducted in such a manner as not to result in permanent impacts associated with the ill placement of project components or associated infrastructure.

The identification and assessment of potential positive and negative impacts associated with the construction phase of the Benya Solar PV Facility are presented in **Table 8.1**. The mitigation and enhancement measures associated with each identified impact are illustrated in **Table 8.2**.

Table 8.1: Impact Assessment of Benya Solar PV Facility Construction Phase

Issue/Benefit	Nature of Impact	Extent of Impact	No-Go Areas
Creation of employment opportunities and skills development	• **Employment opportunities during construction:** - Jobs created for low-skilled, semi-skilled, and skilled workers - Employment will be temporary, lasting for the duration of the construction period - Skills gained during construction will be retained by community members • **Economic benefits:** - Income injection into the local economy through wages - Opportunities for local businesses due to increased economic activity	Local	The current status quo is maintained due to no impact; however, the no-go option would signify that the positive impacts in terms of employment and economic benefits would be lost.
Influx of jobseekers	• **Potential impacts of influx of jobseekers:** - Increased pressure on economic and social infrastructure - Changes in the local population - Temporary increase in crime levels, social disruption, and pressure on basic services	Local	The current status quo is maintained due to no impact.
Increased opportunities for local businesses and service providers	• **Opportunities for local businesses and service providers:** - Supply of construction materials and equipment - Provision of workforce essentials • **Economic multiplier effects:** - Increased demand for local goods and services may stimulate business and economic growth - Potential for industry growth and secondary business development - Off-site accommodation may be required in nearby towns for contract workers and employees • **Economic and employment benefits:** - Income injection into the local economy through wages - Job creation at businesses supporting construction or supplying project materials - Additional income circulation leading to increased local expenditure - Positive downstream benefits such as improved household income, education, and social development	Local to Regional	The current status quo is maintained due to no impact; however, the no-go option would signify the positive impacts in terms of the lost injection of income into the area.
Potential or fear of increase in crime	• The commencement of construction activities can be associated with an increase in crime within an area. • The perceived loss of security during the construction phase may result from an influx of workers and/or outsiders. • In-migration of newcomers, construction workers, or jobseekers is usually linked to increased crime. • **Indirect effects may include:** - Increased safety and security concerns for neighbouring properties. - Damage to property. - Increased risk of wildfires. - Stock theft. - Poaching. - Other criminal activities. • The remoteness of the surrounding region, characterized by spread-out farmsteads due to the agricultural landscape, may create psychological distress and a perceived risk to safety.	Local	The current status quo is maintained due to no impact.

Issue/Benefit	Nature of Impact	Extent of Impact	No-Go Areas
	• Awareness of a project in the area may attract jobseekers, and if unsuccessful, some may resort to crime as a means of income.		
Increased nuisance-associated impacts	• **Impacts associated with construction-related activities include:** - Noise - Dust - Possible disruption to adjacent properties • **Construction-related noise concerns:** - Not typical of the agricultural landscape - Generated by construction equipment, vehicle/truck traffic, and ground vibration - Can be audible over a large distance but is generally of short duration • **Dust-related impacts:** - Caused by site clearing activities - Generated from construction activities and vehicle movement on gravel access roads - Can negatively affect sensitive receptors and surrounding land users	Local	The current status quo is maintained due to no impact.
Increased risk of wildfires	• **Increased wildfire risk during construction due to:** - Construction-related activities - Presence of construction workers on-site • **Potential consequences of wildfires:** - Loss of livestock - Damage or destruction of farmsteads - Loss or damage to farm infrastructure - Threats to human lives	Local	The current status quo is maintained due to no impact.
Health implications	• **Health and safety risks during the construction phase:** - Increased risk of HIV/AIDS transmission due to a resident workforce and an influx of job seekers - Injury or fatal accidents from the use of heavy machinery and equipment - Higher risk of vehicle accidents due to increased traffic on farm roads and potential reckless driving - Respiratory health issues (e.g., silicosis) caused by dust from construction activities	Local	The current status quo is maintained due to no impact.
Disruption of daily living and movement patterns	• **Potential impacts of increased construction traffic:** - Disruptions to road users and the local community - Increased safety hazards on main roads - Road deterioration and congestion due to heavy vehicle usage - Noise, vibrations, dust, and visual pollution affecting local residents and road users	Local	The current status quo is maintained due to no impact.
Increased stress on existing infrastructure	• **Impacts of increased construction traffic:** - Further strain on already deteriorating roads - Gravel access roads leading to the site are especially vulnerable - Increased wear and tear on roads used by local farmers	Local	The current status quo is maintained due to no impact.
Increased potential of livestock theft or property vandalization	• **Indirect effects may include:** - Increased safety and security concerns for neighbouring properties. - Damage to property. - Increased risk of wildfires. - Stock theft. - Poaching.	Local	The current status quo is maintained due to no impact.

Issue/Benefit	Nature of Impact	Extent of Impact	No-Go Areas
	- Other criminal activities. • The remoteness of the surrounding region, characterized by spread-out farmsteads due to the agricultural landscape, may create psychological distress and a perceived risk to safety.		
Loss of productive farmland	• **Negative impact during construction:** - Loss of productive farmland due to construction activities - Potential impact on grazing land and other agricultural activities	Site	The current status quo is maintained due to no impact.
Impact on sense of place	• **Subjectivity of sense of place:** - Influenced by local demographics and perceptions of trade-offs - Some individuals oppose infrastructure development, while others support large-scale projects - Renewable Energy projects may be perceived as beneficial compared to non-renewable projects • **Potential intrusion impacts on sense of place:** - Aesthetic pollution (e.g., building materials, construction vehicles) - Noise and light pollution - Alteration of rural character	Local	The current status quo is maintained due to no impact.

Description of expected significance of impact

The proposed development has the potential to impact the surrounding area and communities in both a positive and negative manner. The proposed development could lead to the creation of employment opportunities and skills development, and an increase in opportunities for local businesses and service providers. This could provide positive effects on the surrounding communities, as employment in the region is low and therefore would benefit from additional employment opportunities and relieve some of the financial stress associated with unemployment. The associated impacts of the proposed development can be enhanced through the implementation of appropriate mitigation measures. The significance of the project at this stage might be positive medium

The proposed development also has the potential to negatively impact the surrounding area and communities through an influx of jobseekers, potential or fear of increase in crime, increased nuisance-associated impacts, increased risk of wildfires, health implications, disruption of daily living and movement patterns, increased stress on existing infrastructure, increased potential of livestock theft or property vandalization, loss of productive farmland and impact on sense of place. The associated impacts of the proposed development can be minimised through the implementation of appropriate mitigation measures. The significance of the project at this stage might be negative medium.

Gaps in knowledge & recommendations for further study

- Identification of key interested and affected parties, specifically landowners and adjacent landowners.
- Interviews with key stakeholders and affected parties.
- Comments received from I&AP during the public participation process.
- Duration of construction phase (months).
- Number of people employed during the construction phase.
- Breakdown of the number of people employed in terms of low-skilled, semi-skilled and skilled opportunities.
- Estimate of total capital expenditure for the construction phase.
- Indication of where construction workers will be housed (on-site or nearest town).
- Opportunities for on-site skills development and training.
- Description of the typical activities associated with the construction phase, specifically on-site construction activities. This includes how building and infrastructure materials will be transported to the site.
- Information on the nature of the agreements with the affected landowners, specifically with regards to compensation for damage to land, infrastructure, etc.

The site visit and research have been conducted as good as practically possible. No recommendations or further study is necessary at the moment, except when the layout of the project is finalised after the scoping phase.

Table 8.2: Mitigation or enhancement measures for the Benya Solar PV Facility Construction Phase

Nature of the Impact	Proposed Mitigation/Enhancement Measures
Creation of employment opportunities and skills development	• A local employment policy should be adopted to maximise opportunities made available to the local labour force. • Labour should be sourced from the local labour pool as far as possible, and only if the necessary skills aren't available should labour be sourced from (in order of preference) the District Municipality, Province, South Africa, or elsewhere. • Where feasible, training and skills development programmes should be initiated prior to the commencement of the construction phase. • As with the labour force, suppliers should also as far as possible be sourced locally. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.
Influx of jobseekers	• Develop and implement a local procurement policy which prioritises "locals first", as far as possible to prevent the movement of people into the area in search of work. • Engage with local community representatives prior to construction to facilitate the adoption of the locals first procurement policy. • Provide transportation for workers to ensure workers can easily access their place of employment and do not need to move closer to the project site. • As far as possible, working hours should be kept between daylight hours during the construction phase, and/or as any deviation that is approved by the relevant authorities. • Compile and implement a grievance mechanism. • Appoint a Community Liaison Officer (CLO) to assist with the procurement of local labour. • Prevent the recruitment of workers at the project site. • Implement, manage and monitor a grievance mechanism for the recording and management of social issues and complaints. • Establish clear rules and regulations for access to the proposed site. • Where feasible, a security company should be appointed to implement appropriate security procedures to ensure that workers do not remain onsite after working hours, as far as possible. • Inform known local community organisations and policing forums of construction times and the duration of the construction phase. • Establish procedures for the control and removal of loiterers from the construction site.
Increase opportunities for local businesses and service providers	• It is recommended that a local procurement policy is adopted to maximise the benefit to the local economy. • A database of local companies, specifically Historically Disadvantaged Individuals (HDIs) which qualify as potential service providers (e.g., construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) should be created (or sourced from the local Municipality, where available) and companies listed thereon should be invited to bid for project-related work where applicable. • Local procurement is encouraged along with engagement with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers where feasible.
Potential or fear of an increase in crime	• Working hours should be kept within daylight hours during the construction phase, and/or as any deviation that is approved by the relevant authorities. • Provide transportation for workers to prevent loitering within or near the project site outside of working hours. • The perimeter of the construction site should be appropriately secured to prevent any unauthorised access to the site. The fencing of the site should be maintained throughout the construction period. • The appointed EPC Contractor must appoint a security company to ensure appropriate security procedures and measures are implemented. • Access in and out of the construction site should be strictly controlled by a security company appointed to the project. • A CLO should be appointed as a grievance mechanism. A method of communication should be implemented whereby procedures to lodge complaints are set out for the local community to express any complaints or grievances with the construction process. • The EPC Contractor should implement a stakeholder management plan to address neighbouring farmer concerns regarding safety and security. • The project proposed must prepare and implement a Fire Management Plan; this must be done in conjunction with surrounding landowners. • The EPC Contractor must prepare a Method Statement which deals with fire prevention and management.

Nature of the Impact	Proposed Mitigation/Enhancement Measures
Increased nuisance-associated impacts	• 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 for heavy vehicles 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. • Ensure all vehicles are roadworthy, drivers are qualified and are made aware of the potential noise and dust issues. • A CLO should be appointed, and a grievance mechanism implemented.
Increased risk of wildfires	• A firebreak should be implemented during the construction phase. The firebreak should be controlled and implemented around the perimeters of the project site. • Adequate fire-fighting equipment should be provided and readily available on site and all staff should be trained in firefighting and how to use the fire-fighting equipment. • No staff (except security) should be accommodated overnight on site and the contractor should ensure that no open fires are allowed on site. The use of cooking or heating implements should only be used in designated areas. • Contractors need to ensure that any construction related activities that might pose potential fire risks, are done in the designated areas where it is also managed properly. • Precautionary measures need to be taken during high wind conditions or during the winter months when the fields are dry. • The project will adhere to the National Forest and Veld Fires Act and the fire management plan. It is recommended that the project proponent join the local fire association or implement their own third-party insurance.
Health implications	• HIV/AIDS awareness talk should be made compulsory as part of induction. • Employees should at all times be supplied and utilise appropriate PPE. • Road safety measures should be incorporated in and around the site to reduce the likelihood of accidents. • As far as possible, employment positions should be filled by local persons residing in the area. • Monitor dust levels and ensure dust mitigation measures are in place. • Non-employees should not be allowed on site, without the proper personnel accompanying them.
Disruption of daily living and movement patterns	• All vehicles must be road worthy, and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues. • Heavy vehicles should be inspected regularly to ensure their road worthiness. • Provision of adequate and strategically placed traffic warning signs, that have to be maintained for the duration of the construction phase, and control measures along the gravel road to warn road users of the construction activities taking place for the duration of the construction phase. Warning signs must be always visible, especially at night. • Implement penalties for reckless driving to enforce compliance to traffic rules. • As far as possible, avoid heavy vehicle activity during “peak” hours (when children are taken to school, or people are driving to work). • The developer and EPC Contractor must ensure that all fencing along access roads is maintained in the present condition or repaired if disturbed due to construction activities. • The developer and EPC Contractor must ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if disturbed due to construction activities. • The EPC Contractor must ensure that damage / wear and tear caused by construction related traffic to the access roads is repaired before the completion of the construction phase. • A method of communication must be implemented whereby procedures to lodge complaints are set out for the local community to express any complaints or grievances with the construction process.
Increased stress on existing infrastructure	• An agreement should be implemented in collaboration with local farmers and the municipality for the maintenance of gravel access roads and contribute to the maintenance of the roads as per the agreement. • The applicant should consider contributing to the maintenance of tarred roads used, in collaboration with the local municipality.
Increase potential of livestock theft or property vandalization	• Develop and implement a local procurement policy which prioritises “locals first”, as far as possible to prevent the movement of people into the area in search of work. • Engage with local community representatives prior to construction to facilitate the adoption of the locals first procurement policy. • As far as possible, working hours should be kept between daylight hours during the construction phase, and/or as any deviation that is approved by the relevant authorities. • Appoint a Community Liaison Officer (CLO) to assist with the procurement of local labour.

Nature of the Impact	Proposed Mitigation/Enhancement Measures
	• Where feasible, a security company should be appointed to implement appropriate security procedures to ensure that workers do not remain onsite after working hours, as far as possible. • A communication platform should be established for local farmers to report cases of livestock theft or vandalization if it can be proved that the instance was a direct result of the construction activities related to the proposed facility.
Loss of productive farmland	• The proposed site for the development needs to be fenced off prior to the construction phase and all construction related activities should be confined in this fenced off area. • Livestock grazing on the proposed development footprint area need to be relocated. • The Environmental Control Officer (ECO) will continuously monitor that all construction activities occur within the project boundary, in the case of construction activities occurring outside the project boundary determined by the ECO, the required remediation procedures will be implemented. • Implement, manage and monitor a grievance mechanism for the recording and management of social issues and complaints. • Mitigation measures from the Agricultural and Soil Report, should also be implemented.
Impact on sense of place	• Implement mitigation measures identified in the Visual Impact Assessment (VIA) prepared for the project. • To the extent possible, limit noise generating activities to normal daylight working hours and avoid weekends and public holidays. • 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 for heavy vehicles 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. • All vehicles must be road-worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. • Communication, complaints, and grievance channels must be implemented and contact details of the CLO must be provided to the local community in the study area.

8.2. Operational Phase Impacts Associated with the Benya Solar PV Facility

The facility will operate continuously, seven days a week, during daylight hours. While the solar facility will be largely self-sufficient, monitoring and periodic maintenance activities will be required. Key elements of the Operation and Management (O&M) Plan include monitoring and reporting the performance of the solar facility, conducting preventative and corrective maintenance, receiving visitors, and maintaining security.

The identification and assessment of potential positive and negative impacts associated with the operational phase of the Benya Solar PV Facility are presented in **Table 8.3**. The mitigation measures associated with each identified impact are illustrated in **Table 8.4**.

Table 8.3: Impact Assessment of Benya Solar PV Facility Operational Phase

Issue/Benefit	Nature of Impact	Extent of Impact	No-Go Areas
Improvement of National Energy Supply and Stability	• **Current reliance on coal-generated electricity in South Africa:** - High carbon emissions due to reliance on coal, which is energy-intensive and a major contributor to Greenhouse Gas (GHG) emissions • **Benefits of solar power for energy generation:** - Solar technology is a non-consumptive use of a natural resource with zero GHG emissions during operation - Contribution to South Africa's electricity market by diversifying energy sources - Solar power projects are a significant part of the REIPPP Programme, contributing to the country's energy diversification and GHG reduction • **Economic impacts of the renewable energy (RE) sector:** - Diversification of the local economy, contributing to greater economic stability - Skills development and new job opportunities, especially in solar power, as many other solar projects are proposed in the region - Contribution to the local economy through employment generation (direct, indirect, and local service providers) and revenue generation	National/International	The current status quo is maintained due to no impact; however, the no-go option would signify that the positive impacts in terms of the generation of renewable energy for South Africa would be lost.
Creation of employment and skills development	• **Employment opportunities during the operational phase:** - Long-term work opportunities generated for the duration of the project's operation • **Economic benefits:** - Income injection into the local economy through wages - Opportunities for local businesses due to increased economic activity	Local to Regional	The current status quo is maintained due to no impact; however, the no-go option would signify that the positive impacts regarding employment and economic benefits would be lost.
Contribution to Local Economic Development (LED) and social upliftment	• **REIPPP Programme requirements:** - Projects must contribute to Local Economic Development (LED) and social upliftment initiatives within the proposed area - A percentage of revenue must be allocated to socio-economic and enterprise development - Ownership shares must be given to local communities, especially those that are previously disadvantaged - A portion of dividends generated must be reinvested in LED projects and programmes • **Potential socio-economic benefits:** - Positive contributions towards socio-economic development in the local area - Improved infrastructure provision - Investment in education and skills development	National	Loss of contribution to LED and social upliftment during the operation of the project.
Decrease in the surrounding regions' tourism potential	• **Disruptions to the area's sense of place:** - Likely to reduce the potential for tourism activities, especially those relying on the rural ambiance - Game farming is a key economic activity in the area, with wildlife resorts and hunting farms relying on a "rural feel" • **Impact on tourism and local economy:** - The presence of industrial infrastructure could contradict the rural charm sought by tourists - A compromised sense of place may lead to a decline in the appeal of nearby game farms, especially for international tourists - This could result in income loss and potential job cuts in the tourism and game farming sectors	Local	The current status quo is maintained due to no impact.

Issue/Benefit	Nature of Impact	Extent of Impact	No-Go Areas
Impact on sense of place	• **Subjectivity of sense of place:** - Influenced by local demographics and perceptions of trade-offs - Some individuals oppose infrastructure development, while others support large-scale projects - Renewable Energy projects may be perceived as beneficial compared to non-renewable projects • **Potential intrusion impacts on sense of place:** - Aesthetic pollution - Noise and light pollution - Alteration of rural character	Local	The current status quo is maintained due to no impact.

Description of expected significance of impact

The proposed development has the potential to impact the surrounding area and communities in both a positive and negative manner. The proposed development could lead to an improvement of national energy supply and stability, the creation of employment opportunities and skills development, and a contribution towards the Local Economic Development and social upliftment. The associated impacts of the proposed development can be enhanced through the implementation of appropriate mitigation measures. The significance of the project at this stage might be positive medium

The proposed development also has the potential to negatively impact the surrounding area and communities through a decrease in the surrounding regions' tourism potential and impact on sense of place. The associated impacts of the proposed development can be minimised through the implementation of appropriate mitigation measures. The significance of the project at this stage might be negative medium.

Gaps in knowledge & recommendations for further study

- Duration of the operational phase.
- Number of people employed during the operational phase.
- Breakdown of the number of people employed in terms of low-skilled, semi-skilled and skilled opportunities.
- Indication of where workers will be housed (on-site or nearest town).
- Description of the typical activities associated with the operational phase.
- Information on the nature of the agreements with the affected landowners, specifically with regards to compensation for damage to land, infrastructure, etc.

The site visit and research have been conducted as good as practically possible. No recommendations or further study is necessary at the moment, except when the layout of the project is finalised after the scoping phase.

Table 8.4: Mitigation or enhancement measures for the Benya Solar PV Facility Operational Phase

Nature of the Impact	Proposed Mitigation/Enhancement Measures
Improvement of National Energy Supply and Stability	• None identified.
Creation of employment and skills development	• It is recommended that local employment policy is adopted to maximise the opportunities made available to the local community. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. • Vocational training programs could be established to promote the development of skills, or other investments in local skills development, education and/or local enterprise development initiatives.
Contribution to Local Economic Development (LED) and social upliftment	• A CNA must be conducted as far as practically possible to ensure that the LED and social upliftment programmes proposed by the project are meaningful. • Ongoing communication and reporting are required to ensure that maximum benefit is obtained from the programmes identified, and to prevent the possibility for such programmes to be misused. • The programmes should be reviewed on an ongoing basis to ensure that they are best suited to the needs of the community at the time (bearing in mind that these are likely to change over time).

Nature of the Impact	Proposed Mitigation/Enhancement Measures
Decrease in the surrounding regions tourism potential	• Due to the extent of the project no viable mitigation measures can be implemented to eliminate the visual impact of the PV panels, but the subjectivity towards the PV panels can be influenced by creating a “Green Energy” awareness campaign, educating the local community and tourists on the benefits of renewable energy. Information regarding the project will be available on a website under the projects name, providing information about the project.
Impact on sense of place	• To effectively mitigate the visual impact and the impact on sense of place during the operational phase of the proposed development, it is suggested that the recommendations made in the Visual Impact Assessment (specialist study) should be followed in this regard.

8.3. Cumulative Impacts

The EIA Regulations (as amended in 2017) determine that cumulative impacts, "*in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities*." Cumulative impacts can be incremental, interactive, sequential or synergistic. EIAs and BAs have traditionally failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires coordinated institutional arrangements;
- Complexity - dependent on numerous fluctuating influencing factors which may be completely independent of the controllable actions of the proponent or communities; and
- Project-level investigations are ill-equipped to deal with broader biophysical, social and economic considerations

According to the DFFE's database (REEA_OR_2024_Q4), one other energy-related application has been submitted to the Department within the geographic area of investigation (refer to **Table 8.5** and **Figure 8.1** for an overview of the applications within a 30 km radius of the project site).

Table 8.5: A summary of related projects, that may have a cumulative impact, in a 30 km radius of the study area

Project name	Distance from study area (km)	Proposed generating capacity	DFFE reference	EIA process	Project status
Projects included in the REEA database (November 2024)					
PPC Dwaalboom Cement Plant Heat Recovery Plant in Thabazimbi, Limpopo Province	8,6 km	19MW	14/12/16/3/3/1/1112	BAR	Approved

*** It is unclear whether other projects not related to energy is or has been constructed in this area, and whether other projects are proposed. In general, development activity in the area is focused on agriculture. It is quite possible that future solar farm development may take place within the general area.*

The potential for cumulative impacts to occur as a result of the projects is therefore likely. Potential cumulative impacts identified for the project include positive impacts on the economy, business development, and employment, as well as negative impacts such as an influx of job seekers and change in the area's sense of place.

The geographic spread of renewable projects, administrative boundaries and any environmental features (the nature of the landscape) were considered when determining the geographic area of investigation. It was argued that a radius of 30 km would generally confine the potential for cumulative effects within this particular environmental landscape. A larger geographic area may be used to analyse cumulative impacts based on the specific temporal or spatial impacts of a resource. For example, the socioeconomic cumulative analysis may include a larger area, as the construction workforce may draw from a much wider area. The geographic area of analysis is specified in the discussion of the cumulative impacts for that resource where it differs from the general area of evaluation described above. The cumulative impact associated with the Benya Solar PV Facility is presented below in Section 8.3.1.

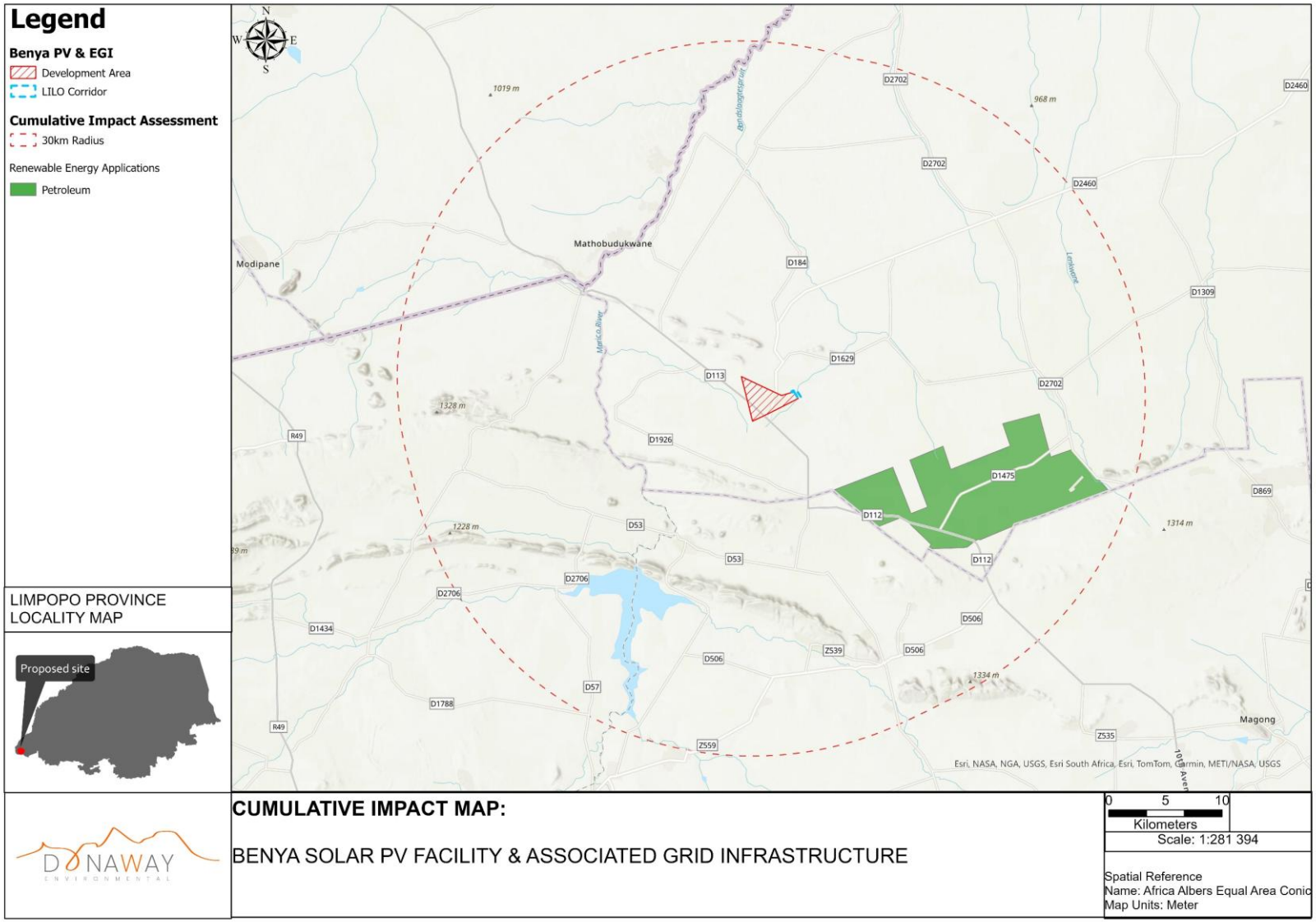

Figure 8.1: Benya Solar PV Facility Geographic area of evaluation with utility-scale energy generation sites

8.3.1. Cumulative Impacts Associated with the Benya Solar PV Facility

The cumulative impact associated with the Benya Solar PV Facility considers the cumulative impact on employment and economic opportunities, and the cumulative impact of large-scale in-migration of people. Considering the potential impact of the Benya Solar PV Facility project in isolation and the cumulative impact of the Benya Solar PV Facility and all other projects within a 30 km radius is discussed below:

8.3.1.1. Cumulative Impact on Employment and Economic Opportunities

The proposed Benya Solar PV Facility and the establishment of other renewable energy projects within the area have the potential to result in significant positive cumulative impacts, specifically with regard to the creation of a number of socio-economic opportunities for the region, which in turn, can result in positive social benefits. The positive cumulative impacts include the creation of employment, skills development and training opportunities, and downstream business opportunities. The cumulative benefits to the local, regional, and national economy through employment and procurement of services are more considerable than those of the Benya Solar PV Facility alone.

8.3.1.2. Cumulative Impacts of Large-Scale In-Migration of People

While the development of a single solar power project may not result in a major influx of people into an area, the development of several projects may have a cumulative impact on the in-migration and movement of people. In addition, the fact that the project is proposed within an area characterised by good levels of solar irradiation suitable for the development of commercial solar energy facilities implies that the surrounding area is likely to be subject to considerable future applications for PV energy facilities. Levels of unemployment and the low level of earning potential may attract individuals to the area in search of better employment opportunities and higher standards of living.

It is exceedingly difficult to control an influx of people into an area, especially in a country where unemployment rates are high. It is therefore important that the project proponent implement and maintain strict adherence to a local employment policy in order to reduce the potential of such an impact occurring.

8.4. Decommissioning Phase

Typically, major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income and will be similar to the impacts during the construction phase. This has implications for the households that are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed Benya Solar PV Facility, it is anticipated that the proposed facility will be refurbished and upgraded to prolong its life. No decommissioning of the facility is proposed.

8.5. Assessment of Alternative Sites

No alternative sites have been identified for assessment. The proposed project site was chosen due to its suitable climatic conditions, topography (i.e., in terms of slope), environmental conditions (i.e., low agricultural potential, ecological sensitivity and archaeology), proximity to the existing Eskom grid connection infrastructure, and proximity to existing roads (i.e., to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase). The final location of the proposed project on the proposed site will be informed by technical considerations and inputs from the relevant specialist studies (including the SIA) being undertaken as part of the Scoping process.

8.6. Assessment of Impacts for the No-Go Alternative

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

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

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

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

- Potential direct and indirect employment opportunities.
- Potential economic multiplier effect.
- Development of non-polluting, renewable energy infrastructure.

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

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

The option of not developing the proposed Benya Solar PV Facility would not compromise the development of RE facilities in South Africa. However, the socio-economic benefits for local communities associated with this specific project would be forfeited.

9. KEY FINDINGS AND RECOMMENDATIONS

9.1. Key Findings

The SIA has assessed the development of the Benya Solar PV Facility and associated grid connection infrastructure, located on the Remaining Extent of Farm Portugal No. 198 and Farm Napoleon No. 216, approximately 72 km north west of the town of Northam in the Limpopo Province. Several positive and negative social impacts have been identified for the project.

Dwaalboom/Northam and surrounding communities can be considered as vulnerable towards the social impacts as they are in close proximity to the project site and most likely to be impacted by the associated impacts of the proposed development of the Benya Solar PV Facility. The construction phase is traditionally associated with the greatest social impact on communities, with residents and businesses in Dwaalboom/Brits and its surrounding communities most likely affected. Many of the social impacts are unavoidable and will take place to some extent, but can be managed through the careful planning and implementation of appropriate mitigation measures.

Based on the social impact assessment, the following general conclusions and findings can be made:

- The construction phase of the Benya Solar PV Facility, like any other construction project, may bring about negative social impacts, such as the influx of non-local workers and job seekers, disturbance due to noise and dust pollution, increase in road usage which could lead to road damage, and safety concerns in the region. The impacts are not limited to PV projects but are rather common in most construction projects. These impacts can be reduced by implementing proposed mitigation measures. Therefore, taking proactive measures to minimise the significance of these impacts on Dwaalboom/Northam and the surrounding communities.
- The proposed Benya Solar PV Facility will introduce visual intrusion into the surrounding regions of the project. The visual intrusion, although it will be screened by the vegetation cover in the region and therefore not affect nearby communities as much.
- The development of the Benya Solar PV Facility will generate employment opportunities for individuals from the Dwaalboom/Northam and surrounding communities. Specifically, this would benefit the Thabazimbi LM as a large proportion of the population is not economically active (34.4%) or is unemployed (13.1%).
- The implementation of the Benya Solar PV Facility is expected to enhance skill development in the community and lead to better employment opportunities. This, in turn, will equip the workers with valuable knowledge and skills that can be beneficial for their future professional endeavours.
- The Thabazimbi LM's economy has the potential to benefit from the proposed project by fostering entrepreneurial growth and opportunities, particularly for local businesses in Dwaalboom/Northam. These businesses, involved in the provision of general materials, goods, and services during both the construction and operational phases, are likely to experience positive impacts. Furthermore, the cumulative effects of developing additional solar facilities to the currently proposed facilities could amplify these benefits.
- The proposed development of the Benya Solar PV Facility represents an investment in non-polluting and renewable energy infrastructure. In comparison to energy generated through the combustion of fossil fuels, this presents a favourable social benefit for society.

- Some of the surrounding landowners have raised their concerns regarding the project. They are concerned about the change in the sense of place, ecological impacts and safety and security during the construction phase. One business in the area is concerned about the impact that might be associated with a change in aesthetics in the area.

9.2. Recommendations

The following recommendations are made based on the SIA. The proposed mitigation measures should be implemented to limit the negative impacts and enhance the positive impacts associated with the project. Based on the social assessment, the following recommendations are made:

- The appointment of a Community Liaison Officer (CLO) to assist with the management of social impacts and to deal with community issues, if feasible.
- It is imperative that local labour be sourced, wherever possible, to ensure that benefits accrue to the local communities. Efforts should be made to involve local businesses during the construction activities, where possible. Local procurement of labour and services/products would greatly benefit the community during the construction and operational phases of the project.
- Local procurement of services and equipment is required where possible to enhance the multiplier effect.
- Involve the community in the process as far as possible (encourage cooperative decision-making and partnerships with local entrepreneurs). In particular, the community needs to be involved during the public participation process of the EIA, whereby their comments are relevant, feasible, practical and of concern, should be addressed.
- Employ mitigation measures to minimise dust and noise pollution and damage to existing roads. In particular, the project should be subject to adherence to the National Environmental Management: Air Quality Act (Act No 39 of 2004) and measures in respect of dust control. Employing the National Dust Control Regulations of November 2013 during the construction phase will limit gaseous or particulate emissions as anticipated from exhaust emissions from construction vehicles and equipment on-site, as well as vehicle-entrained dust from the movement of vehicles on the internal access roads.
- National noise control regulations & SANS 10103:2008: the Measurement and Rating of Environmental Noise should be implemented to reduce the overall noise impact.
- Construction activities will ensure that damage to public roads and access roads attributable to construction vehicles is repaired prior to the completion of the construction phase.
- Safety and security risks should be considered during the construction phase of the proposed project. Access control, security, and management should be implemented to limit the risk of crime increasing in the area. In particular, the scoping phase of the EIA should identify possible safety and security risks associated with the proposed development to be implemented prior to the construction phase.

9.3. Need for a Social Impact Assessment

A social impact assessment is essential for a solar energy facility for several reasons. First, it helps ensure that the well-being of local communities is considered. Solar projects can significantly affect the surrounding areas, influencing employment opportunities, infrastructure, and the quality of life.

The SIA provides a thorough understanding of how the project will impact the community, allowing for the consideration of local needs and concerns before construction begins.

Additionally, solar facilities often require large areas of land, which may affect agricultural use, local ecosystems, or even wildlife habitats. The SIA evaluates the social consequences of such land use changes, addressing how these transformations could impact people who rely on the land for their livelihoods. This assessment is crucial in minimising adverse effects on land users and surrounding communities.

The potential health and safety risks associated with the construction and operation of a solar facility are another reason for conducting an SIA. These projects can introduce environmental or safety hazards, which could have long-term implications for the local population. An SIA helps identify these risks and ensure that proper measures are in place to protect public health and safety.

The economic impact of a solar facility is another critical factor that the SIA addresses. Solar projects often bring new job opportunities, but it's important to assess whether these jobs will benefit local residents or if a significant portion of the workforce will come from outside the area. The SIA helps gauge the economic benefits to the local community, ensuring that the project aligns with the area’s economic needs. In summary, an SIA will ensure that the benefits of the solar facility are maximized, while minimizing any negative social impacts, leading to more sustainable and harmonious development.

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ANNEXURE 1: CURRICULUM VITAE

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Contact Information

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Email: michael@donaway.co.za

Personal Information

Date of Birth: 23 March 1996
Nationality: South African
Profession: Environmental Consultant
Position: Visual and Social Specialist

Key Qualifications

- MSc. Geography and Environmental Management North West University (2020)
- Hons. Geography and Environmental Management North West University (2018)
- BSc. Geology and Geography North West University (2017)

Contact Information

Michael Cloete has extensive knowledge and experience in the environmental science field, in particular social impacts, hydrogeology and GIS fields. Visual impacts assessment and the methodological approach formed the basis of his Masters and Honours studies, gaining extensive knowledge in the field. His recent focus involved renewable projects and the social and visual impact assessment studies. Below is a list of the number of projects completed for each field of assessment:

- 50+ Social Impact Assessments, with the majority associated with Photovoltaic Solar Energy Projects in the Free State, Limpopo, North West, Mpumalanga, Northern Cape, Gauteng and Western Cape Provinces. In addition, Battery Energy Storage Facilities and Accommodation camps has formed part of Social Impact Assessment.
- 80+ Hydrogeological Assessments regarding water use licencing for agriculture, industrial and mining activities.
- Hydropedological studies relating to water-feeding systems of wetlands.
- Water use licence auditing and reporting.
- GIS applications for report writing and hydrogeological assessments, ranging from map creation to spatial analyst procedures.

Johan Botha

Contact Information

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Personal Information

Date of Birth:	18 February 1985
Nationality:	South African
Profession:	Environmental Consultant
Position:	Director & Consultant

Key Qualifications

- Honours in Environmental Management (Hons.Env.Man.), North West University (NWU), SA (2010)
- B. Ed. in Geography & Technology, North West University (NWU), SA (2004–2008)

Contact Information

Johan Botha has extensive knowledge and experience on Renewable Energy projects and more specifically the visual and social impacts surrounding photovoltaic solar energy facilities and wind energy facilities in South Africa. He also has knowledge and experience in environmental management of Eskom power infrastructure projects as well as solar energy facilities, focusing on EA and EMP implementation as well as TOPS counts and permitting. He has completed 150+ Visual Impact Assessments and 70+ Social Impact Assessments for renewable energy projects and mining. Below is a list of the number of projects completed for each field of assessment:

- 6 Environmental Control Officer (ECO) Projects on Eskom Substation and Transmission lines in the Northern Cape Province
- 1 ECO Project on a Solar Power Plant in the Northern Cape Province
- 150+ Visual Impact Assessments for Photovoltaic Solar Energy Projects, Wind Energy and alluvial Diamond Mines across South Africa
- 70+ Social Impact Assessments for Photovoltaic Solar Energy Projects across South Africa
- 12 Threatened or Protected Specie Surveys and Permit Applications.