DONAWAY
ENVIRONMENTAL

SOCIAL IMPACT ASSESSMENT

The Proposed Kareerand Battery Energy Storage System
near Klerksdorp, North West Province

PROJECT DETAILS

Project title: **Social Impact Assessment –** The Proposed Kareerand Battery Energy Storage System near Klerksdorp, North West Province

Prepared by: Johan Botha & Michael Cloete
Donaway Environmental
30 Fouché Street
Steynsrus
9515
Tel: +27 82 316 7749
Email: johan@donaway.co.za

Prepared for: Kareerand BESS (Pty) Ltd

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EXECUTIVE SUMMARY

PROJECT BACKGROUND

Kareerand BESS (Pty) Ltd ('the Applicant') is proposing the construction of the Kareerand Battery Energy Storage (BESS) Facility, consisting of a BESS and solar photovoltaic (PV) infrastructure, and associated infrastructure, located on Portion 3 of the Farm Kareerand No. 444, approximately 22 km east of Klerksdorp within the North West Province. A powerline of up to 11.5km is also proposed to evacuate the electricity into the national grid. The proposed development is located within the Klerksdorp Renewable Energy Development Zone (REDZ). The proposed development is intended to form part of the Department of Mineral Resources and Energy (DMRE) Battery Energy Storage Independent Power Producer Procurement (BESIPPP) Programme, but the option also exists for other tenders, wheeling or to supply privately, without a generation license from NERSA.

The BESIPPP and Renewable Energy Independent Power Producer Procurement (REIPPP) programmes, aims to secure new generation capacity from renewable energy sources and battery energy storage, while simultaneously diversifying South Africa's electricity mix. According to the 2021 State of the Nation Address, Government will soon be initiating the procurement of an additional 11 800 MW of power from renewable energy, natural gas, battery storage and coal in line with the Integrated Resource Plan 2019 and fulfilling their 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 emission by 2050 and to increase its renewable capacity.

The proposed development of the Kareerand BESS facility requires Environmental Authorisation (EA) from the competent environmental authority in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), and the 2014 Environmental Impact Assessment (EIA) Regulations.

The Social Impact Assessment (SIA) Report has been prepared by Donaway Environmental on behalf of Kareerand BESS (Pty) Ltd and is intended to provide input into the EIA process.

PROJECT DESCRIPTION

The scope of the assessment includes an up to 77MW Battery Energy Storage System (BESS) facility covering an approximate area of 25 hectares. The facility include; PV modules and mounting structures, inverters and transformers, Solid State Battery Energy Storage System (BESS), site and internal access roads, Operation and Maintenance buildings including a gate house and security building, control centre, offices, warehouses and workshops for storage and maintenance, laydown areas, a 132 kV facility substation and 33 kV cabling between the project components and the facility substation. The facility will include grid connection infrastructure consisting of a 132kV Eskom Switching Station and a 132kV powerline connecting the Eskom switching station to the Hermes Main Transmission Substation.

It is anticipated that the construction and operational phase of the project is likely to create employment opportunities, comprising of low-skilled, semi-skilled, and skilled opportunities.

Employment opportunities include safety and security staff, operation and monitoring, and maintenance crew.

APPROACH TO THE STUDY

The research approach followed for the development of an SIA study is based on the Guidelines for Involving Social Impact Assessment Specialists in the EIA process that was prepared for the Department of Environmental Affairs and Development Planning for the Western Cape Province of South Africa in February 2007. These guidelines for development and planning of Social Impact Assessments (SIA) 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 intervention; 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).

This study followed the research approach similar to the components identified above. This study followed a qualitative research approach. The steps involved in the research approach for this study involved:

- 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 (Kareerand BESS (Pty) Ltd).
- 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.

SUMMARY OF KEY FINDINGS

This SIA focused on the collection of data to identify and assess social issues and potential social impacts associated with the development of the Kareerand BESS facility. Secondary data was collected and presented in a literature review. The environmental assessment framework for assessment of impacts and the relevant criteria were applied to evaluate the significance of the potential impacts. A summary of the potential positive and negative impacts identified for the detailed design and construction, and operation phase are presented in **Table A** and **Table B**. A summary of the potential positive and negative cumulative social impacts identified for the project is provided in **Table C**.

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

Impact	Significance Without Mitigation / Enhancement	Significance With Mitigation / Enhancement
Positive Impact		
Creation of direct and indirect employment and skills development opportunities.	Positive Low (22)	Positive Low (24)
Economic multiplier effects	Positive Low (18)	Positive Medium (36)
Negative Impacts		
Potential loss of productive farmland	Negative Low (22)	Negative Low (18)
In-migration of people (non-local workforce and jobseekers).	Negative Medium (36)	Negative Low (16)
Safety and security impacts	Negative Medium (33)	Negative Low (18)
Impacts on daily living and movement patterns	Negative Medium (30)	Negative Low (16)
Nuisance impact (noise and dust)	Negative Medium (30)	Negative Low (18)
Potential impacts of increased risk of potential veld fires	Negative Medium (36)	Negative Low (18)
Visual and sense of place impacts	Negative Low (24)	Negative Low (22)

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

Impact	Significance Without Mitigation / Enhancement	Significance With Mitigation / Enhancement
Positive Impact		
Direct and indirect employment and skills development opportunities	Positive Low (15)	Positive Low (17)
Development of non-polluting, renewable energy infrastructure	Positive Low (18)	Positive Low (18)
Contribution to LED and social upliftment	Positive Medium (48)	Positive High (72)
Potential impacts on tourism	Positive Low (24)	Positive Low (24)
Negative Impacts		
Potential impacts on tourism	Negative Low (24)	Negative Low (24)
Impacts associated with the loss of agricultural land.	Negative Low (26)	Negative Low (11)

Visual and sense of place impacts	Negative Low (28)	Negative Low (13)

Table C: Summary of potential cumulative social impacts identified for the project

Cumulative Impact	Significance Without Mitigation / Enhancement	Significance With Mitigation / Enhancement
Positive Cumulative Impact		
Cumulative impact from employment, skills and business opportunities and skills development	Positive Low (13)	Positive Medium (42)
Negative Cumulative Impacts		
Cumulative impact with large-scale in-migration of people	Negative Low (20)	Negative Medium (39)

There are some vulnerable communities within the project area that may be affected by the development of the Kareerand BESS facility and its associated infrastructure. Traditionally, the construction phase of an alternative energy storage solution facility is associated with most social impacts. Many of the social impacts are unavoidable and will take place to some extent but can be managed through the careful planning and implementation of appropriate mitigation measures. Several potential positive and negative social impacts have been identified for the project, however an assessment of the potential social impacts indicated that there are no perceived negative impacts that are so significant to allow them to be classified as “fatal flaws”.

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

- The construction phase of the Kareerand BESS 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 BESS projects but rather common in most construction projects. These impacts can be reduced by implementing proposed mitigation measures. Therefore, taking proactive measures to minimize the significance of these impacts on Klerksdorp and the surrounding communities.
- The development of the Kareerand BESS facility will generate employment opportunities for individuals from the Klerksdorp and surrounding communities. During the construction phase, approximately 100 job opportunities will be created, providing a temporary source of employment. Specifically, this would benefit the JB Marks LM and City of Matlosana LM as a large proportion of the population is not economically active (40.4% for JB Marks LM and 35.7% for the City of Matlosana LM) or is unemployed (12.7% and 19.6%). Following the construction phase, a limited number of job opportunities will be available during the operational phase. By reducing the region’s dependency and boosting overall quality of life, the Kareerand BESS facility will contribute significantly to the community’s economic growth. Additionally, this would create jobs outside the current main job creator in the region.

- The implementation of the Kareerand BESS facility is expected to enhance the 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. Consequently, the overall educational level of the people residing in the JB Marks LM and City of Matlosana LM is expected to improve.
- The JB Marks and City of Matlosana LM's economy has the potential to benefit from the proposed project by fostering entrepreneurial growth and opportunities, particularly for local businesses in Klerksdorp and surrounding town. The JB Marks LM is included although the closet town, Klerksdorp, is not situated within the local municipality. 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 alternative energy storage solution facilities to the currently proposed facilities could amplify these benefits.
- The proposed development of the Kareerand BESS facility represents an investment in alternative energy storage solutions. In the possibility of electricity supplied from renewable energy sources presents a favourable social benefit for society.
- It should be noted that the perceived benefits associated with the Kareerand BESS facility, which include electricity storage to reduce supply strain and local economic and social development, outweigh the perceived negative impacts associated with the project.
- The proposed development of the Kareerand BESS facility could reduce current loadshedding associated with the country, specifically reducing the current strain on Eskom power generation facilities. Not only can it supply electricity when demand is high but store the surplus electricity from either traditional Eskom sources or other renewable sources. Which in return could reduce strain imposed on companies as a result of loadshedding. In return this could lead current and future work opportunities to be of a more stable nature and not impose additional strain on companies.

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 co-operative decision making and partnerships with local entrepreneurs).
- Employ mitigation measures to minimise the dust and noise pollution and damage to existing roads.

- Safety and security risks should be considered during the planning / construction phase of the proposed project. Access control, security and management should be implemented to limit the risk of crime increasing in the area.

CONCLUSION

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

The proposed Kareerand BESS facility has the potential to generate additional income and employment opportunities for Klerksdorp and the surrounding communities. This benefit could be particularly significant to reduce the dependency of job opportunities in the mining sector, with the majority of the economic development and working opportunities associated with the mining activities. As a whole, unemployment in South Africa is significantly high and additional job opportunities would not only benefit the region but the overall South African employment ratio. Positive impacts can be associated with the Kareerand BESS facility with regard to a reduction in electricity supply strain, as the facility could supply required power to the grid during higher demand stages where supply could not achieve the set out requirement. In return, this could lead to a reduction in load shedding and the strain on Eskom power and renewable utilities.

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LIST OF ACRONYMS

AC	Alternating Current
BESIPPP	Battery Energy Storage Independent Power Producer Procurement (BESIPPP) Programme
BAR	Basic Assessment Report
B-BBEE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
BESS	Battery Energy Storage System
CLO	Community Liaison Officer
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	Economically Active Population
ECA	Environment Conservation Act (No. 73 of 1989)
ECO	Environmental Control Officer
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPC	Engineering, Procurement and Construction
FGM	Focus Group Meeting
FMP	Fire Management Plan

GDP	Gross Domestic Product
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
IUCN	International Union for Conservation of Nature
GIS	Geographic Information System
km	Kilometre
kV	Kilovolt
LED	Local Economic Development
LM	Local Municipality
MW	Megawatt
NDP	National Development Plan
NEPCO	National Electrical Power Company
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
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

Kareerand BESS (Pty) Ltd ('the Applicant') is proposing the construction of the Kareerand Battery Energy Storage (BESS) Facility, consisting of a BESS and solar photovoltaic (PV) infrastructure, and associated infrastructure, located on Portion 3 of the Farm Kareerand No. 444, approximately 22 km east of Klerksdorp within the North West Province. A powerline of up to 11.5km is also proposed to evacuate the electricity into the national grid. The proposed development is located within the Klerksdorp Renewable Energy Development Zone (REDZ). The proposed development is intended to form part of the Department of Mineral Resources and Energy (DMRE) Battery Energy Storage Independent Power Producer Procurement (BESIPPP) Programme, but the option also exists for other tenders, wheeling or to supply privately, without a generation license from NERSA.

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The proposed development of the Kareerand BESS facility requires Environmental Authorisation (EA) from the competent environmental authority in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), and the 2014 Environmental Impact Assessment (EIA) Regulations.

The Social Impact Assessment (SIA) Report has been prepared by Donaway Environmental on behalf of Kareerand BESS (Pty) Ltd and is intended to provide input into the EIA process.

1.2. Project Location

The proposed Kareerand BESS Facility is located approximately 22km east of the town of Klerksdorp, while the powerline is located approximately 12km from Klerksdorp. The R502 regional road situated approximately 5.5km north-west of the proposed development, while the powerline intersects the regional road.

Please refer to **Figure 1.1** below, Locality Map.

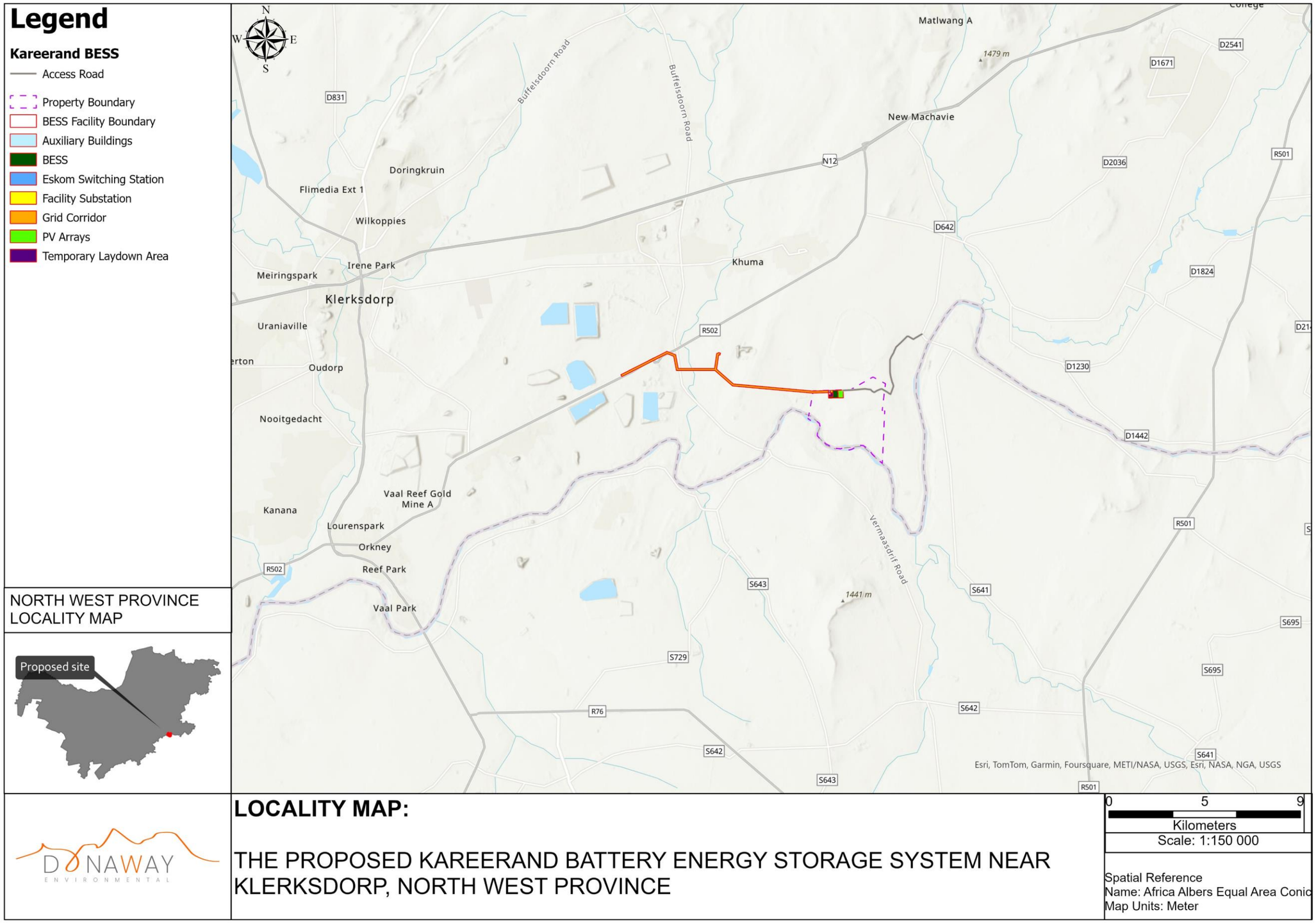

Figure 1.1: Locality map for the proposed Kareerand BESS Facility near Klerksdorp, North West Province

1.3. Project Description & Technical Detail

The Kareerand BESS facility will have a total development footprint of up to approximately 25 ha and will have a maximum export capacity of up to 77 MW. The development area is situated within the City of Matlosana Local Municipality and the JB Marks Local Municipality. The site is accessible via existing tarred and gravel roads to the north-east of the site. These existing gravel roads will be upgraded to a maximum width of 8m. The details of the location of the Kareerand BESS facility are included in **Table 1.1**:

Table 1.1: General site information

Description of affected farm portions	<u>BESS and PV:</u> • Portion 3 of the Farm Kareerand No. 444 <u>Grid connection:</u> • Portion 3 of the Farm Kareerand No. 444 • Portion 15 of the Farm Kromdraai 443 • Remainder of Portion 5 of Farm no. 422 • Portion 6 of the Farm Buffelsfontein 443 • Portion 3 of the Farm Kareerand 444 • Portion 2 of the Farm Buffelsfontein 443 • Portion 103 of the Farm Hartebeestfontein 422 • Portion 38 of the Farm Hartebeestfontein 422 • Portion 79 of the Farm Hartebeestfontein 422 • Portion 8 of the Farm Hartebeestfontein 422 • Portion 2 of the Farm Mapaiskraal No. 441 • Portion 41 of the Farm Hartebeestfontein 422 • Portion 4 of the Farm Mapaiskraal 441 <u>Access road</u> • Portion 3 of the Farm Kareerand No. 444 • Portion 4 of the Farm Kareerand 444 • Portion 16 of the Farm Kromdraai 420 • Portion 17 of the Farm Kromdraai 420 • Farm Umfula No. 575, • 20 of Farm Umfula No. 567 • Portion 56 of the Farm Kromdraai 420
Province	North West
Local Municipality	JB Marks & City of Matlosana
District Municipality	Dr Kenneth Kaunda
Ward numbers	2, 34 and 33
Closest towns	The town of Stilfontein is located approximately 11km north west of the proposed development.

Area under assessment (Development Area)	25 hectares
Development footprint	25 hectares

1.3.1. Technical Details

The development footprint associated with the BESS facility will include specific infrastructure that will be developed as part of the facility layout.

The design of the detailed layout will however consider and adhere to the limitations of the development area and aspects such as environmentally sensitive areas, roads, fencing and servitudes on site. The total surface area proposed for the layout will include the PV panel arrays (spaced to avoid shadowing), the BESS facility, access and maintenance roads and associated infrastructure (buildings, power inverters, power line, on-site substation and collector substation and perimeter fences).

The proposed Kareerand BESS facility will include the following infrastructure:

- PV modules and mounting structures (up to 10 ha).
- Inverters and transformers.
- Solid State Battery Energy Storage System (BESS) (up to 10 ha).
- Site and internal access roads (up to 8m wide).
- Operation and Maintenance buildings including a gate house and security building, control centre, offices, warehouses and workshops for storage and maintenance (up to 1 ha).
- Laydown areas (3 ha temporary and 1 ha permanent).
- A 132 kV facility substation (up to 1 ha).
- 33 kV cabling between the project components and the facility substation.

The project will also include Grid connection infrastructure consisting of:

- A 132 kV Eskom Switching Station (up to 1 ha).
- 132 kV powerline (up to 11.5 km long) connecting the Eskom switching station to the Hermes Main Transmission Substation (a grid connection corridor of 100m wide will be assessed to allow for environmental sensitivities and/or micro-siting).

The Grid connection infrastructure, although assessed cumulatively with the BESS, will be subject to a separate environmental application process administered by the provincial authority.

1.4. Consideration of Alternatives

This section describes the alternatives under consideration for the Kareerand BESS 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 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	One preferred site / development area has been identified for the development of the Kareerand BESS facility based on specific site characteristics such as proximity to the Nation grid and Hermes MTS, the solar resource, land availability, topographical characteristics and environmental features. The development area of 25 hectares is considered to be sufficient for the development of the facility with a contracted capacity of up to 77 MW. The development footprint will have an extent of up to 25 ha.
Activity Alternatives	Only the development of a BESS and renewable energy facility is considered by Kareerand BESS (Pty) Ltd. Due to the location of the site / development area and the suitability of the solar resource, only the development of a BESS and solar PV facility is considered feasible considering the natural resources and land 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 BESS and photovoltaic solar facility is considered due to the characteristics of the site, including the natural resources and land available.
'Do-nothing Alternative	The option to not construct the Kareerand BESS 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 facility in the area will however not be made available.

1.5. EIA Regulations

The National Environmental Management Act identifies listed activities (in terms of Section 24) which are likely to have an impact on the environment. These activities cannot commence without obtaining an EA from the relevant competent authority. Sufficient information is required by the competent authority to make an informed decision and the project is therefore subject to an environmental assessment process which can be either a Basic Assessment Process or a full Scoping and Environmental Impact Assessment process.

The EIA Regulations No. 324, 325, and 327 outline the activities that may be triggered and therefore require EA.

1.6. Terms of Reference

The terms of reference (TOR) in an SIA according to Barbour (2007:28) should indicate how and to what extent the SIA specialist should be involved for the purpose and scale of the proposed intervention.

Specialists in their field of expertise will consider baseline data and identify and assess impacts according to predefined rating scales. Specialists will also suggest optional or essential ways in which to mitigate negative impacts and enhance positive impacts. Further, specialists will, where possible, take into consideration the cumulative effects associated with this and other projects, which are either developed or in the process of being developed in the local area. 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. The Terms of Reference (ToR) or general requirements proposed for the inputs are listed below:

General Requirements:

Specialists' reports must comply with Appendix 6 of GNR982 published under sections 24(5), and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and whereby the following are to be included:

Table 1.3: Appendix 6 of GNR326 – Report sections

Requirements of Appendix 6 – GN R326 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.	Page i and Section 1.7
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 1
The date and season of the site investigation and the relevance of the season to the outcome of the assessment.	Section 4.4. 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
An identification of any areas to be avoided, including buffers.	This will be reflected in Section 6 and in Section 7 if applicable.
A map superimposing the activity including the associated structures and infrastructure on the	Section 1.

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Relevant section in report
environmental sensitivities of the site including areas to be avoided, including buffers.	
A description of any assumptions made and any uncertainties or gaps in knowledge.	Section 2.4
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 7
Any mitigation measures for inclusion in the EMPr.	Section 6 and Section 7
Any conditions for inclusion in the environmental authorisation.	Section 7
Any monitoring requirements for inclusion in the EMPr or environmental authorisation.	Section 7
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 7
A description of any consultation process that was undertaken during preparing the specialist report.	Section 2.2 and Table 4.1 and 4.2. Public Participation Process undertaken as part of the 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 4.1 and 4.2. Public Participation Process undertaken as part of the 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:

- The details of the specialist who prepared the report and the expertise of that specialist to compile a specialist report including a curriculum vitae.
- A declaration that the specialist is independent in a form as may be specified by the competent authority.
- An indication of the scope of, and the purpose for which, the report was prepared.
- The date and season of the site investigation and the relevance of the season to the outcome of the 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.
- An identification of any areas to be avoided, including buffers.
- 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.
- A description of any assumptions made and any uncertainties or gaps in knowledge.
- A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment.
- Any mitigation measures for inclusion in the EMPr;
- Any conditions for inclusion in the environmental authorisation.
- Any monitoring requirements for inclusion in the EMPr or environmental authorisation.
- 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.
- A description of any consultation process that was undertaken during the course of preparing the specialist report.
- A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and
- Any other information requested by the competent authority.

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 familiarize 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 in order 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 context of the study.
- Reference all sources of information and literature consulted; and
- Include an executive summary to the report.

The terms of reference for this SIA requires to provide the following:

- Provide a description of the environment that may be affected by the activity and the way the environment may be affected by the proposed facility.
- Provide a description and assessment of the potential social issues associated with the proposed facility; and
- Identify enhancement and mitigation aimed at maximizing opportunities and avoiding and or reducing negative impacts.

The key activities in the SIA process as embodied in the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007) will include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, location), the communities likely to be affected and determining the need and scope of the SIA.
- Collecting baseline data on the current social environment and historical social trends.
- Identifying and collecting data on the Social Impact Assessment variables and social change processes related to the proposed intervention. This requires consultation with affected individuals and communities.
- Assessing and documenting the significance of social impacts associated with the proposed intervention; and
- Identifying alternatives and mitigation measures.

In this regard the study should involve:

- Review of demographic data from the Census Survey.
- Review of relevant planning and policy frameworks for the area.
- Site specific information collected during the site visits to the area and interviews with key stakeholders.
- Review of information from similar projects; and
- Identification of social issues associated with the proposed project.

1.7. Project Team and Experience

The project team will consist of Johan Botha and Michael Cloete.

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 100+ Visual Impact Assessments (VIA) and 50+ 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 Assessments (VIA). Accumulating two years of environmental specialist knowledge and reporting in the Hydrogeology field. The accumulated experience provides the necessary skills to conduct visual and social impact assessments.

2. METHODOLOGY

2.1. Purpose of the Study

Social Impact Assessments are defined by International Principles 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 wellbeing – health is a state of complete physical, mental, social and spiritual wellbeing and not merely the absence of disease or infirmity,
- Their personal and property rights – particularly whether people are economically affected or experience personal disadvantage which may include a violation of their civil liberties.
- Their fears and aspirations – their perceptions about their safety, their fears about the future of their community, and their aspirations for their future and the future of their children.

The purpose of this SIA 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.

2.2. Approach to the Study

The research approach followed for the development of an SIA study is based on the Guidelines for Involving Social Impact Assessment Specialists in the EIA process that was prepared for the Department of Environmental Affairs and Development Planning for the Western Cape Province of South Africa in February 2007. These guidelines for development and planning of Social Impact

Assessments (SIA) 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 and 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 intervention; 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 research approach to this study is similar to scientific social research methods. A literature review was conducted to define and gain a basic understanding of the key concepts.

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, it may not create impacts, but depending on the context, these social change processes might lead the social impact on a community. Examples of such social processes include the increase of population, the influx of temporary workers, relocation of communities etc. According to Vanclay (2002) 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 worldview and the way they react to impacts and changes.

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 (IAIA, 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, 2014). Esteves and Vanclay (2009:140) and Hildebrandt (2014) go 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.

This 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 phenomena from a participants' point of view (De Vos et al., 2011). This

research approach mainly relies on converting information from observations, reports, and recordings into data and then into the written word.

This study followed the research approach similar to the components identified above. The steps involved in the research approach for this study involved:

- 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 (Kareerand BESS (Pty) Ltd).
- 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.

The identification of the potential social issues associated with the proposed intervention is based on the review of relevant documentation, experience from previous projects and the observations during the project site visits. The methodology used to assign the significance ratings to the assessment process will be discussed below.

2.2.1. Stakeholder Identification and Analysis

Stakeholders are defined as: “Any group or organisation which may affect or be affected by the issue under consideration” (UN, 2001:26).

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 level etc. (Franke and Guidero, 2021).

Stakeholder analysis involves the identification of affected or impacted people and their key grouping and sub-groupings (IFC, 2007). 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 to the proposed development. Affected stakeholders comprise sensitive social receptors that may potentially be affected by the proposed development based on their location.

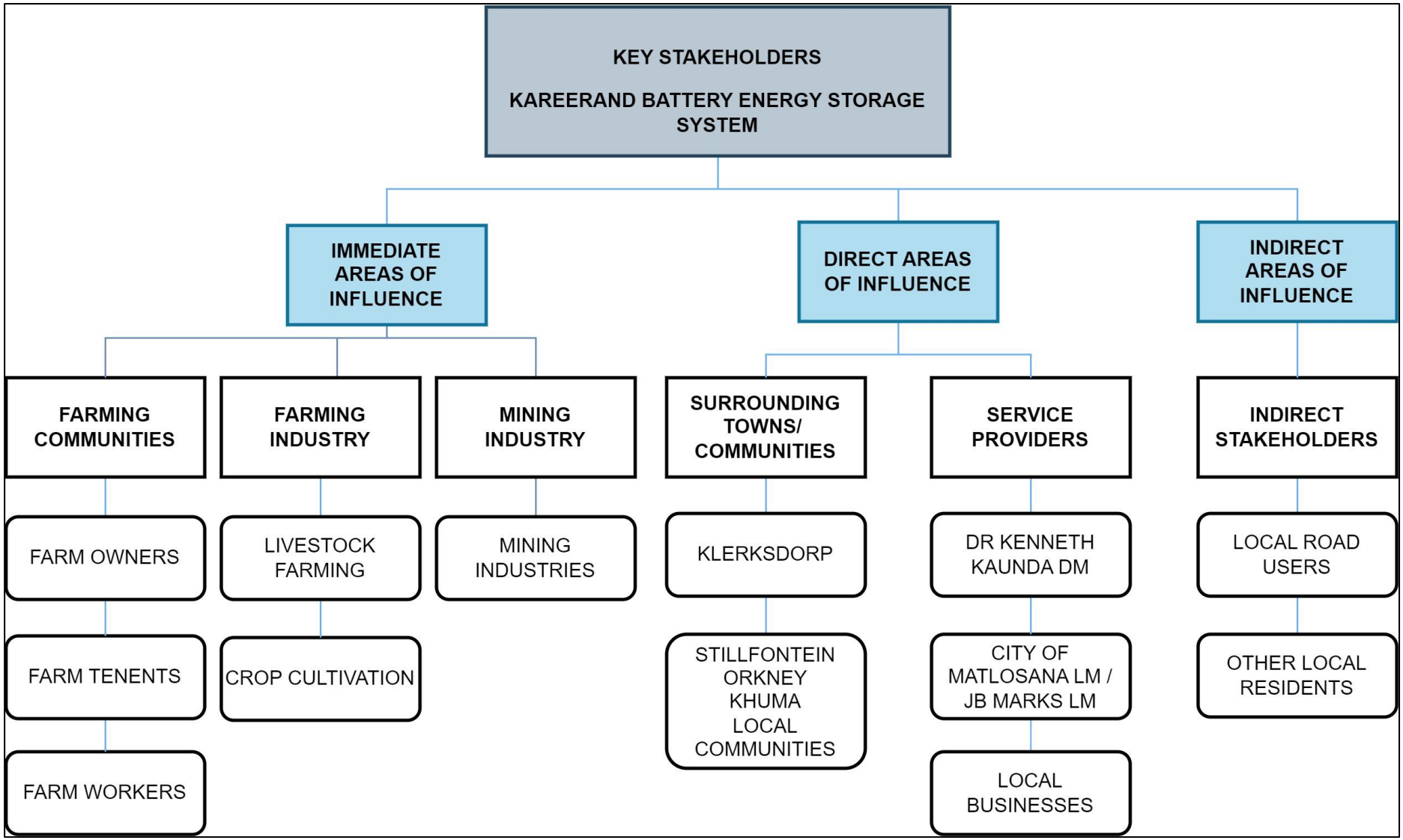

Figure 2.1: Key Stakeholders of the proposed Kareerand BESS Facility

A description of each of the stakeholder's groups in relation to Kareerand 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. 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 alternative energy solution 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 and crop cultivation. 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 and threaten food security. Noise and movement of people may also negatively impact on farming operations.

- **Mining industry:** A significant portion of the surrounding region is occupied with multiple mining areas, including tailings, underground mining and mining communities. Impacts that may arise from the project include safety concern and increase in movement in relation to the mining activities. Impacts may be insignificant due to the relatively busy movement related to mining activities.

- **Surrounding towns / affected communities:** The closest town to the proposed project is Klerksdorp, located approximately 22km east from the proposed development. Residents within Klerksdorp, local communities and surrounds 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) Klerksdorp and surrounding towns which will present a positive impact for the local community. In addition, contributions to Social Development of the local communities in terms of the DoE's requirements under the REIPPP and BESIPPP Programmes will result in local upliftment and positive impacts.

- **Service providers:** Major service providers that will be affected by the project include the Dr Kenneth Kaunda DM, JB Marks LM and City of Matlosana LM, and local businesses in the area. The Dr Kenneth Kaunda DM, JB Marks LM and the City of Matlosana LM are likely to be impacted by the proposed development. The JB Marks LM and Dr Kenneth Kaunda LM are Category B municipality, meaning that it shares municipal executive and legislative authority in the area with the Dr Kenneth Kaunda DM. The JB Marks LM and City of Matlosana LM will absorb a number of positive and negative social impacts in the form of employment creation, increased local expenditure, and 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 that utilise the R502 regional roads and 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.

2.2.2. 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), Community Survey (2016), Local Government Handbook (2018) and Census data (2022)
- 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.

2.2.3. Collection of Primary Data

The JB Marks LM, City of Matlosana LM and Dr Kenneth Kaunda DM is being engaged by the Environmental Assessment Practitioner and their comments obtained as part of the EIA process being undertaken and will be considered in this SIA where relevant.

2.3. Baseline Assessment – Significance Rating

Impact assessment must take account of the nature, scale and duration of impacts on the social environment and whether such impacts are positive or negative. Each impact is also assessed according to the social receptors and the following project phases:

- Planning;
- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving social receptors and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact, **Table 2.1** below, will be utilised as the baseline impact assessment for each social receptor and phases of the project.

Table 2.1: Impact Significance Rating

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).

DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible, rehabilitation

		and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible, and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an		

impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

2.4. Assumptions and Limitations

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

2.4.1. Limitations

- Data available within the 2011 Census, Community Survey 2016, 2022 Census, North West Draft Strategic Plan (2015), North West Spatial Development Framework (2016), Dr Kenneth Kaunda District Municipality Integrated Development Plan 2022 – 2027, Dr Kenneth Kaunda District Municipality Development Model: One Plan (2023), City of Matlosana Local Municipality Integrated Plan 2022-2027, City of Matlosana Spatial Development Framework (2021), and the JB Marks Integrated Development Plan 2022-2027. was used to generate most information provided in the baseline profile of the study area. The possibility therefore exists

that the data utilised may be out of date and may not provide an accurate reflection of the current status quo.

- This SIA Report 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 regards 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.

2.4.2. Assumptions

The first assumption identified is the strategic importance of promoting energy storage solutions. This however is supported by the national and provincial policies discussed in Section 3 of this report. In addition to this the fit with key planning and policy documents is a key component of the SIA process, in order to identify and assess the potential social impacts of the development. In the case where the findings of this review reflect that the proposed development does not conform to the related policy documents, then the proposed development can't be supported. However, as indicated above this proposed study does recognise the strategic importance of promoting energy storage solution. Secondly, it is assumed that the proposed development site for the Kareerand BESS Facility is technically suitable for the establishment thereof.

Lastly, it is also assumed that the motivation for, and planning and feasibility study of the project were undertaken with integrity, and that information provided by the project proponent was accurate and true at the time of preparing this SIA Report.

3. LEGISLATION AND POLICY REVIEW

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

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

National Policy and Planning Context:

- Constitution of the Republic of South Africa (1996)
- National Environmental Management Act (No. 107 of 1998) (NEMA)
- White Paper on the Energy Policy of the Republic of South Africa of (1998)
- 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:

- North West Draft Strategic Plan (2015)
- North West Province Spatial Development Framework (2016)

District Level Policy and Planning Context:

- Dr Kenneth Kaunda District Municipality Integrated Development Plan 2022 – 2027 (2022)
- Dr Kenneth Kaunda District Municipality Development Model: One Plan (2023)

Local Level Policy and Planning Context:

- City of Matlosana Local Municipality Integrated Development Plan 2022 – 2027 (2022)
- City of Matlosana Spatial Development Framework (2021)
- JB Marks Local Municipality Integrated Development Plan 2022 – 2027 (2022/2023)

3.1. National Policy and Planning Context

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

project and would contribute RE supply to provincial and national targets set out and supported within these national policies, it is considered that the project fits within the national policy framework.

A brief review of the most relevant national legislation and policies is provided below.

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

The Constitution of the Republic of South Africa (1996) is the supreme law of South Africa and forms the foundations 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 to environmental impacts.

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

The National Environmental Management Act (No. 107 of 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 (1998)

The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa's energy security. This can be achieved through increased use of RE and encouraging new entries into the generation market. South Africa has an attractive range of cost-effective renewable resources, taking into consideration social and environmental costs. Government policy on RE is thus concerned with meeting the following challenges:

- Ensuring that economically feasible technologies and applications are implemented.
- Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options.
- Addressing constraints on the development of the renewable industry.

The policy states that the advantages of RE include, minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include higher capital costs in some cases, lower energy densities, and lower levels of availability, depending on specific conditions, especially with sun and wind-based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future. The White Paper on Energy Policy therefore supports the advancement of RE sources and ensuring energy security through the diversification of supply.

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

The White Paper on Renewable Energy Policy 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 RE sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing RE in South Africa. The country relies heavily on coal to meet its energy needs due to its abundant, and accessible and affordable coal resources. However, massive RE resources that can be sustainable alternatives to fossil fuels, have so far remained largely untapped.

The White Paper on Renewable Energy Policy fosters the uptake of RE in the economy and has a number of objectives that include: ensuring equitable resources are invested in renewable technologies, directing public resources for implementation of RE technologies, introducing suitable fiscal incentives for RE and, creating an investment climate for the development of the RE sector.

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.

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

The purpose of the National Energy Act (No. 34 of 2008) is to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, while taking environmental management requirements into account. In addition, the Act also provides for energy planning, and increased generation and consumption of Renewable Energies (REs).

The objectives of the Act, are 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.

3.1.6. Integrated Energy Plan (IEP) (2016)

The Integrated Energy Plan (IEP) (which was developed under the National Energy Act (No. 34 of 2008)), recognises that energy is essential to many human activities, and is critical to the social and economic development of a country. The purpose of the IEP is essentially to ensure the availability of energy resources, and access to energy services in an affordable and sustainable manner, while minimising associated adverse environmental impacts. Energy planning therefore needs to balance the need for continued economic growth with social needs, and the need to protect the natural environment.

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 8 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.

3.1.7. Integrated Resources Plan (IRP) (2019)

Please note: The Integrated Resource Plan of 2019 remains valid and is still included within this report until the Integrated Resource Plan of 2024 is approved, currently in Draft.

The Integrated Resource Plan (IRP) 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.

The Policy-Adjusted IRP reflected recent developments with respect to prices for renewables. In addition to all existing and committed power plants, the plan includes 9.6GW of nuclear, 6.25GW of coal, 17.8GW of renewables, and approximately 8.9GW of other generation sources such as hydro, and gas.

Besides capacity additions, several assumptions have changed since the promulgation of IRP 2010–2030. Key assumptions that changed include the electricity demand projection, Eskom's existing plant performance, as well as new technology costs. These changes necessitated the review and update of the IRP which resulted in the draft IRP 2018 as per **Table 3.1** below:

Table 3.1: Published Draft IRP 2018 (Approved by Cabinet for Consultation)

	Coal	Nuclear	Hydro	Storage (Pumped Storage)	PV	Wind	CSP	Gas / Diesel	Other (CoGen, Biomass, Landfill)	Embedded Generation
2018	39 126	1 860	2 196	2 912	1 474	1 980	300	3 830	499	Unknown
2019	2 155					244	300			200
2020	1 433				114	300				200
2021	1 433				300	818				200
2022	711				400					200
2023	500									200
2024	500									200
2025					670	200				200
2026					1 000	1 500		2 250		200
2027					1 000	1 600		1 200		200
2028					1 000	1 600		1 800		200
2029					1 000	1 600		2 850		200
2030			2 500		1 000	1 600				200
TOTAL INSTALLED	33 847	1 860	4 696	2 912	7 958	11 442	600	11 930	499	2600
Installed Capacity Mix (%)	44.6	2.5	6.2	3.8	10.5	15.1	0.9	15.7	0.7	

Installed Capacity
Committed / Already Contracted Capacity
New Additional Capacity (IRP Update)

According to the South African Energy Sector Overview (2021), there is currently 1 723MW of installed PV capacity, while an additional 2 600MW and 860MW from wind and solar has been rewarded as part of Bid window 5 and 6, respectively.

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

Please note: The Integrated Resource Plan of 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 a 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, hydro, storage and hydrogen 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 3.2**.

Table 3.2: 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[x]	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

3.1.9. National Development Plan 2030 (2012)

The National Development Plan (NDP) 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030. The NDP aims to achieve this by drawing on the energies of its people, growing and inclusive economy, building capabilities, enhancing the capacity of the state and promoting leaderships 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 Sectors 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.

3.1.10. 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:

- 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 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.

3.1.11. Strategic Infrastructure Projects (SIPs)

The Presidential Infrastructure Coordinating Committee (PICC) are integrating and phasing investment plans across 18 Strategic Infrastructure Projects (SIPs) which have the following 5 core functions:

- 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. Kareerand BESS 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. North West Draft Strategic Plan (2015)

Vision

A united, non-racial, non-sexist and prosperous democratic society for the people of Bokone Bophirima (North West Province) to uplift the quality of life.

Mission

To facilitate integrated governance and accelerate service delivery that is people-centred for improved economic growth in North West through integrated planning, policy frameworks, coordination, performance monitoring and evaluation.

Values

- Caring
- Agile
- Responsive
- Excellence

3.2.2. North West Draft Strategic Plan (2015)

The North West Development Plan accepted 8 development priorities to align to the National Development

Plan (NDP). The development priorities constitute the first five-year inaugural plan of economic transformation in the North West province, which includes the following:

- Economy and employment
- Economic infrastructure
- An integrated and inclusive rural economy
- Human settlement and spatial transformation
- Improving education, training and innovation
- Building a capable and developmental state
- Fighting corruption
- Transforming society and uniting the province

North West Spatial Development Framework needs to be conducive for sustainable development and will provide for the execution of the following objectives:

- The alignment of international agreements, protocols and policies on sustainable development as determined by Agenda 21
- The integration of international cooperation and development programmes which includes the Spatial Development Initiatives (SDI's) involving the Coast-to-Coast Development Corridor
- Giving spatial effect to objectives set by National Government Policies on Sustainability to support the optimal integration of the aspects of social, economic, institutional, political, physical and engineering services. The objectives include:
  - The National Development Plan 2030 which promotes an economy that will create more jobs, improving Infrastructure, transition to low carbon economy, an inclusive and integrated rural economy, reversing the spatial effects of apartheid, improving the quality of education, training and innovation, quality health for all, social, protection, building safer communities and reforming the public sector.
  - The National Strategy for Sustainable Development (NSSD) promoting the integration between social demands, natural resource protection, sustainable use and economic development.

  - The Comprehensive Rural Development Programme (CRDP) integrating broad-based agrarian transformation, strategically increasing rural development and land reform programme aiming at tenure reform, restitution and land redistribution
- Restructuring and eliminating the disparate spatial development patterns provided by apartheid planning
- Creating an enabling environment for sustainable employment and economic growth and infrastructure development, promoting the objectives of the National Growth Path, The Industrial Policy Action Plan (IPAP) and The National Infrastructure Plan.
- Providing for the integration of the objectives of sustainable housing
- Reducing inherited spatial divisions and distorted spatial patterns through spatial restructuring tenure reform, restitution and land redistribution
- Addressing the inequality in the spatial distribution of economic activities and population in the province
- Maintaining and developing national and regional roads, railway and airport linkages promoting national, regional and provincial accessibility support the development of Transportation Corridors. These corridors include systems of.
- The optimal utilisation of natural resources by the objectives of:
  - Protecting biodiversity from the development of mines, forestry, urban and rural development, agriculture set by the North West Biodiversity Sector Plan
  - Enhancing the quantity and protecting the quality of water resources
  - Utilising the mineral resources in a responsible way attending to the effect of it on the environment
  - Protecting and high and unique potential agriculture land and the reduction of available land due to the development of mines, urban and rural areas and forestry.

3.3. District and Local Municipality Policies

The strategic policies at DM and LM level have similar objectives for the respective areas, namely, to accelerate economic growth, create jobs, and uplift communities. Kareerand BESS 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. Dr Kenneth Kaunda Integrated Development Plan 2022-2027 (2022)

Vision

“Exploring prosperity through sustainable service delivery for all.”

Mission

“To provide an integrated district management framework in support of quality service delivery.”

Strategic Goals and Objectives

The Constitution of the Republic of South Africa, Act No. 108 of 1996, section 152(1) state that the objects of local government are;

- To provide democratic and accountable government for local communities;
- To ensure the provision of services to the communities in a sustainable manner;
- To promote social and economic development;
- To promote a safe and healthy environment; and
- To encourage the involvement of communities and community organizations in the matters of local government.

The following are the key (general) strategic goals and objectives maintained:

- To promote physical infrastructure development and services.
- To promote socio-economic development.
- To provide environmental health services.
- To ensure disaster risk management.
- To promote integrated transport services.
- To promote community safety.
- To ensure internal municipal excellence.

These goals are in support of the 5-year strategic agenda for local government and in cognisance of the strategic imperatives facing the district. These goals were broken down into the following core strategic objectives.

3.3.2. Dr Kenneth Kaunda District Development Model: One Plan 2023

Vision Statement and the Desired Future

The district reimagines by 2050, to become an investment friendly developmental economic destination, underpinned by agriculture, tourism, manufacturing, sustained trade and sports excellence through a multi-skilled community, aligned to the National Development Plan (NDP), the National Spatial Development Framework (NSDF), and other key national, provincial, and local socio-economic and spatial development policies.

Vision and Mission statement of Different Pillars

- **Demography and People Development Vision and Mission**

Ensuring a safe and healthy environment for citizens who are skilled and prosperous. A multi- skilled community that will participate in the regional economy where they will earn sufficient and sustainable income through employment and entrepreneurship sustained by regional economic activities.

- **Demography and People Development Mission**

To progressively improve quality of life and overall wellbeing of citizens of Dr Kenneth Kaunda District Municipality with special focus on upliftment of vulnerable groups.

- **Economic Positioning Vision**

Based on the information provided in the economic provisioning chapter, the vision, objectives, targeted outputs and desired impact have been developed.

The vision is: To create an inclusive economy geared towards recovery, growth and sustainable development.

- **Economic Positioning Objectives**
  - To position Dr Kenneth Kaunda as an investment destination of choice.
  - Reduce gender disparities, unemployment, poverty and inequality by maximizing economic participation.
  - Invest in capacity building and develop skills needed for future industries in ICT and science.
  - To create stable governance with policy certainty and good financial management throughout the district.
  - To place a special focus on growing the tourism, heritage, sports, arts and trade sectors.
  - Harness the economic advantage in agriculture, mining, electricity, trade and community services.
- **Spatial Restructuring Vision**

The common spatial vision for the Dr Kenneth Kaunda District Municipality is as follow:

"Strive to enhance integrated socio-economic and physical development in such a manner that promotes the orientation of transit and logistic spatial development and ensure the protection, sustainable use and proper management of the environment to provide sustainable livelihoods for all citizens"

- **Integrated Services Provisioning Vision**

To provide an effective, efficient, and sustainable integrated services within the district.

- **Integrated Services Provisioning Mission**

To continuously improve the quality of life of the community of Dr Kenneth Kaunda District Municipality through better planning, managing, implementation and monitoring of integrated service delivery.

- **Infrastructure Provisioning Vision**

Infrastructure provision is the glue that binds all the pillars of service delivery, without which their success is simply not possible. Therefore, The Dr Kenneth Kaunda District's infrastructure provision vision seeks to provide and maintain integrated physical assets with the goal to maximize it re-imagined economic potential in areas such as: light manufacturing, tourism, agricultural-processing and mining. Integrated infrastructure asset management (planning, maintenance and decommissioning) is thus envisioned in: energy supply, human settlements, water supply, sanitation services, transportation and communication networks, social and economic sectors. The vision is summarized as follows:

The goal is in line with the national vision 2030: **to sustainably improve the quality of life for all in the district.**

3.3.3. City of Matlosana Integrated Development Plan 2022-2027

Vision

"A proficient and prosperous municipality that delivers high quality services to the citizens"

Mission

"*To render equitable, sustainable and high-quality basic services to the citizens of Matlosana"*

Strategic outcome-oriented goals of the institution

The current IDP 2022-27 is a strategic plan that is premised on the spirit of the White Paper on Local Government and re-ignites our commitment and plan to realize Sustainable Local Government (2030). It is a clear plan for closing the gap between the current reality and the sustainability we desire, and is focused on the developmental agenda espoused by CoM towards the realization of quality service and better communities through:

- Co-operative governance,
- Socio-economic development,
- Integrated development planning, and
- Sustainable utilization of municipal resources.

3.3.4. City of Matlosana Spatial Development Framework 2021

The Spatial Development Vision must be aligned with the Municipal's vision that states: "A proficient and prosperous municipality that delivers high quality services to the citizens''

In terms of this vision the strategic priorities of access rest upon the following pillars:

- Excellence and transformation
- Democratic Governance
- Quality of municipal services
- Infrastructure and utility needs
- Accelerated economic growth (Poverty relief & job creation)
- Financial stability

The spatial development vision must also align with the National Spatial Vision that states that economic growth and employment creation should focus in areas where it is most effective and sustainable, supporting restructuring and by fostering development on the basis of local potential.

The Municipality's Mission is *'To render equitable, sustainable and high quality basic services to the citizens of Matlosana''.*

In view of abovementioned the Matlosana Spatial Development Vision will be:

"Towards a spatially integrated transit and logistics-orientated city that delivers high quality services in a sustainable manner".

The basic principles underlining the Spatial Vision are the following:

- Enhancement of Matlosana in its capacity as one of the primary regional nodes within North West Province, as well as a priority investment area situated on the N12 Treasure Corridor.
- Management towards sustainable development. Sustainability here specifically means the cost-effective provision of services; the creation of job opportunities in close proximity to natural resources and the market and the protection and sustainable use of the natural environment.
- Reducing imbalances of the past through concentrating employment opportunities in areas with sustainable development potential, reducing the mismatch of where people have to live and work.
- Containing urban sprawl by providing development guidelines for the creation of compact quality urban spaces serving dense residential areas.
- Urban integration and urban infilling through the enhancement of urban linkages along mixed land-use corridors and nodes in order to reduce long distance travel.
- Residential intensification through more efficient use of urban land and higher density residential development.
- Creating quality well balanced urban environments, which are convenient, attractive and safe.

The Spatial Development Vision must be aligned with municipal's Agenda 16 (IDP) vision "City of Matlosana" is a well-run City through Good Governance, were Economic Growth and Prosperity and Quality Municipal Service Delivery place it amongst the 5 leading municipalities in South Africa by 2016. In terms of this vision the strategic priorities of success rest upon the following pillars:

- Excellence and transformation
- Democratic Governance
- Quality of municipal services
- Infrastructure and utility needs
- Accelerated economic growth (Poverty relieve & job creation)
- Financial stability

The Council for Scientific and Industrial Research (CSIR) in collaboration with the national Department of Environmental, Forestry and Fisheries identified three additional Energy Development Zones (REDZ).

The new areas have been chosen based on clean energy resource conditions, where mining industries are located, and proximity to areas in need of "'rehabilitation', with local coal power capacity to be decommissioned in the near future.

For Solar PV, Klerksdorp (City of Matlosana) was identified as a new REDZ. The solar areas offer the potential for post-mining land uses, that are close to load centres and have a high irradiation. (Source: CSIR;2020).

3.3.5. JB Marks Integrated Development Plan 2022-2027 (2022/2023)

The North West Provincial Development Plan (NWPDP) is predominantly based on the National Development Plan (NDP) and attempts to align with the vision, objectives and priorities of a united South Africa by 2030.

The chosen development priorities with which the province intends to align to the National Development Plan (NDP) are the following:

- Economy and Employment
- Economic Infrastructure
- An Integrated and Inclusive Rural Economy
- Human Settlement and Spatial Transformation
- Improving Education, Training and Innovation
- Environmental Sustainability
- Social Protection
- Improving Health
- Building Safer Communities
- Building a Capable and Development State
- Fighting Corruption
- Transforming Society and Uniting the Province.

Vision

A transformed, leading, competitive and preferred world class city.

Mission

Provide quality sustainable services that are responsive to our communities' needs within a healthy, safe and green environment through good governance.

Core Values

- Accountable
- Caring
- Integrity
- Respect
- Proactive

KPA 1: Municipal Transformation and Organizational Development

To improve organization stability and sustainability.

KPA 2: Basic Service Delivery and Infrastructure Development

To eradicate backlog in order to improve access and ensure proper operation and maintenance to services and infrastructure development.

KPA 3: Local Economic Development

To create an environment that promotes developments of local economy and facilitate job creation

KPA 4: Municipal Financial Viability and Management

To improve overall financial management in the municipality by developing and implementing appropriate financial management policies, procedure and system.

KPA 5: Good Governance and Public Participation

To promote a culture of participatory and good governance.

KPA 6: Spatial Rationale

Improve the quantity and quality of basic services for all people in terms of water, sanitation, electricity, waste management, roads and disaster management (infrastructure investment & development).

3.4. Conclusion

The review of relevant legislation, policies and documentation pertaining to the energy sector indicate that alternative energy solutions are suitable options to consider regarding the stabilization of the energy sector, therefore the establishment of Kareerand BESS facility is supported at a national, provincial, and metro 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 PROFILE

This Chapter provides an overview of the socio-economic environment within which Kareerand BESS facility is proposed for development and provides the socio-economic basis against which potential issues can be identified.

4.1. North West Province

The North West Province occupies the northern expanse of South Africa and shares its borders with four adjacent provinces: Northern Cape to the west, Free State to the south, Gauteng to the east, and Limpopo Province to the north-east. Its northern boundary extends to Botswana.

Economically, the province's focal point lies within the southern region encompassing Potchefstroom and Klerksdorp, along with Rustenburg and the eastern vicinity. The driving force of the economy is the mining sector, which contributes significantly and constitutes nearly a quarter of South Africa's mining industry. The districts of Rustenburg and Brits are globally renowned as the top producers of platinum. North West also contributes a quarter of South Africa's gold production, in addition to minerals like granite, marble, fluorspar, and diamonds.

Tourism in North West revolves around notable attractions including Sun City, Pilanesberg National Park, Madikwe Game Reserve, and Rustenburg Nature Reserve. The province predominantly features flat terrain with dispersed trees and grasslands, accompanied by the meandering Vaal River along its southern border.

Agriculturally, cattle farming holds substantial importance in North West, while the environs around Rustenburg and Brits are fertile grounds for mixed-crop cultivation. The province stands as a primary contributor to the country's production of white maize, with maize and sunflowers being pivotal crops in the region.

The capital city of North West is Mahikeng, historically referred to as Mafikeng, situated close to the Botswana border. This city forms an integrated urban zone with its adjacent town, Mmabatho. Meanwhile, Potchefstroom and Klerksdorp stand as the largest urban centres, accompanied by other significant towns like Brits, Rustenburg, and Lichtenburg.

Administratively, North West is divided into four district municipalities, each further subdivided into a total of 18 local municipalities within the province.

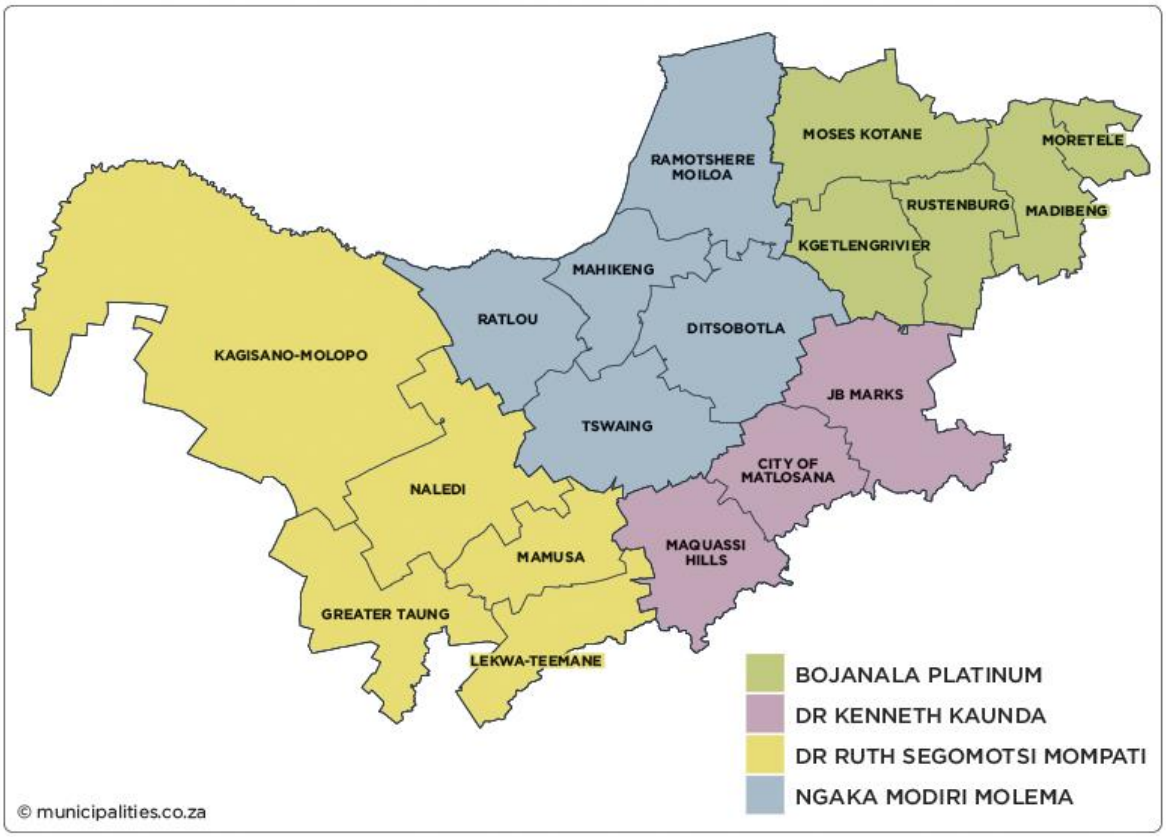

Figure 4.1: Map showing the DMs of the North West Province (Source: www.municipalities.co.za)

4.2. Dr Kenneth Kaunda District Municipality

The Dr Kenneth Kaunda District Municipality (DM) is a Category C municipality situated in the south-eastern expanse of North West. The municipality's boundaries are shared with the Free State Province and Gauteng Province to the south and east, Dr Ruth Segomotsi Mompati DM to the south-west, Ngaka Modiri Molema DM to the west, and Bojanala Platinum DM to the north. Prominent urban centres within the DM's jurisdiction encompass Klerksdorp, Orkney, Potchefstroom, Ventersdorp, and Wolmaransstad. This district is christened after the inaugural president of Zambia.

The region stands as a nexus of natural and cultural diversity, teeming with potential for sustainable economic advancement. It also houses some of the globe's most notable gold mines and encompasses a segment of the Vredefort dome, acknowledged as the world's earliest meteor impact site. The district's key arteries, including the N12 Treasure Corridor, serve as the primary developmental axis, paving the way for forthcoming industrial, commercial, and tourism ventures.

The Dr Kenneth Kaunda DM takes pride in an array of tourist destinations, including the Klerksdorp Museum, renowned for its collection of fossils and artifacts from the locality, and the Boskop Dam Nature Reserve, offering an array of outdoor pursuits such as fishing, boating, and hiking.

This district plays host to diverse tertiary institutions, among which are the North-West University in Potchefstroom and the Vaal University of Technology campus in Klerksdorp.

Administratively, the Dr Kenneth Kaunda DM is segmented into three local municipalities, namely JB Marks LM, City of Matlosana LM, and Maquassi Hills LM.

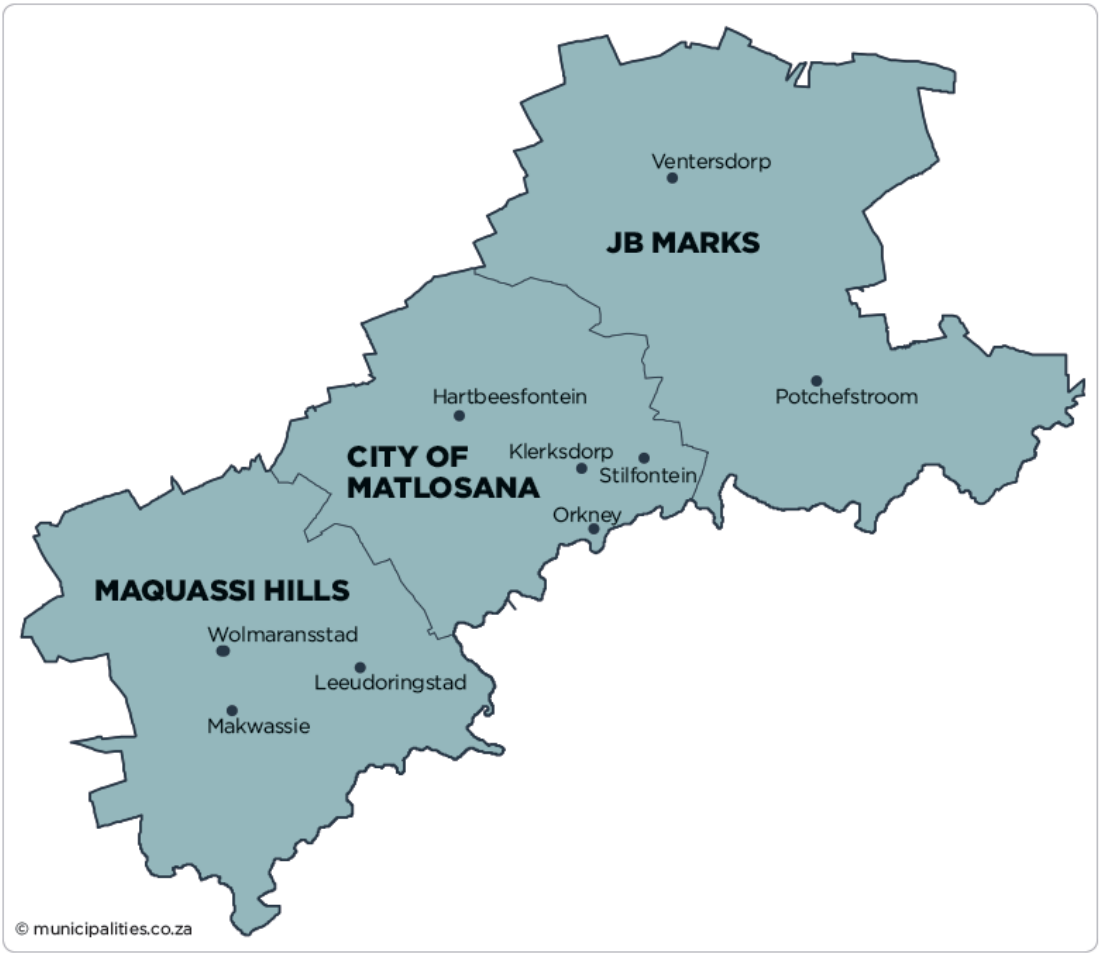

Figure 4.2: Map showing the LMs of the Dr Kenneth Kaunda DM (Source: www.municipalities.co.za)

4.3. City of Matlosana Local Municipality

The City of Matlosana Local Municipality (LM), previously known as the City Council of Klerksdorp, operates as a Category B municipality positioned in the south-eastern sector of the Dr Kenneth Kaunda District, which is a subunit of North West Province. The moniker "Matlosana" is interpreted to convey the notion of "People assisting each other in transitioning from one area to another."

This municipality finds itself nestled amidst the other two LM within the Dr Kenneth Kaunda DM. Specifically, it shares borders with the Maquassi Hills LM to the south-west and JB Marks LM to the north-east. To the north, it adjoins the Ngaka Modiri Molema DM, while its southern border is linked with the Free State Province. In terms of land area, the LM stands as the smallest among the trio within the Dr Kenneth Kaunda DM, constituting a quarter of the total geographical expanse.

The N12 national route, known as the Treasure Corridor, acts as a conduit linking the City of Matlosana LM to the eastern province of Gauteng and the western province of the Northern Cape.

Within the confines of the City of Matlosana LM, prominent towns encompass Klerksdorp, Jouberton, Alabama, Orkney, Kanana, Stilfontein, Khuma, and Hartbeesfontein.

4.4. JB Marks Local Municipality

The JB Marks Local Municipality (LM) is a Category B municipality in the south-eastern part of the North West Province, part of the Dr Kenneth Kaunda DM. The municipality shares its eastern border with the Merafong City LM in Gauteng Province, while to the north lies Rustenburg LM, Kgetlengriver LM, north-west Ditsobotla LM, and City of Matlosana LM to the south-east. Major towns in the municipal region are Potchefstroom and Ventersdorp.

Gold mining is the dominant economic activity in the district, with Potchefstroom and Ventersorp the only exceptions. Ventersdorp is mainly driven by agricultural activities, while Potchefstroom is driven by services and manufacturing. Additionally, the town includes a world class university (North-West University) and several industrial companies in the steel, food and chemical industries.

The 12 national route that connects Johannesburg and Cape Town via Kimberly runs through the municipality. Additionally, the main railway route between Gauteng, Northern Cape and Western Cape runs through Potchefstroom.

4.5. Project Site

The proposed Kareerand BESS facility development will be located on Portion 3 of the Farm Kareerand No. 444, situated in the JB Marks LM, while the grid connection starts within the JB Marks LM and crosses over to the City of Matlosana LM, with are both subdivisions of the Dr Kenneth Kaunda DM within the North West Province. The proposed Kareerand BESS facility is located approximately 22km east of the town of Klerksdorp and 11km south-east of Stillfontein, while the powerline is located approximately 12km from Klerksdorp. The R502 regional road situated approximately 5.5km north-west of the proposed development, while the powerline intersects the regional road. **Figure 1.1** illustrating the locality of the project site.

A site visit was conducted on the 19th of January 2024 on the portion 3 of the farm Kareerand No. 444, North West Province. Please refer to the photos below for a better understanding of the proposed site.

4.6. Land use and cover in the region

Most of the surrounding area has a low number of farmsteads/ buildings that are sparsely populated. The area is located in the agricultural region of the area with livestock and crop cultivation the most prominent activities, additionally significant pivot irrigation occurs along the Vaal River. Significant areas are used for mining activities which include mining communities, mining sites and tailings. **Figure 4.11** illustrates the land use and landcover of the region.

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 site, taken towards the west

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

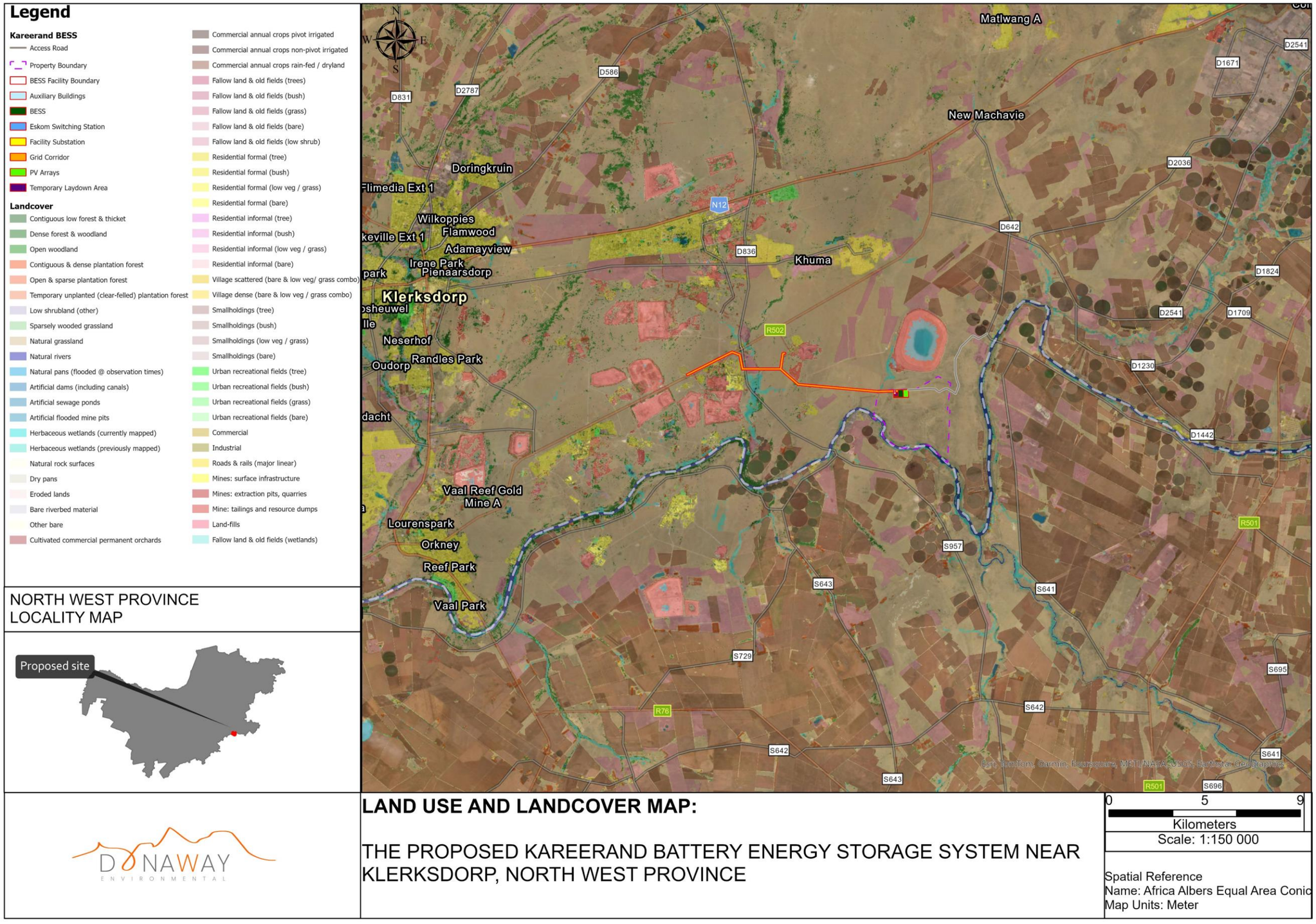

Figure 4.11: Landcover map of the proposed Kareerand BESS facility near Klerksdorp, North West Province

4.7. Baseline Description of the Social Environment

The following subsections provide an overview of the socio-economic profile of the City of Matlosana LM and JB Marks LM. The two local municipalities were both included as the BESS facility is situated in the JB Marks LM but connect to the national grid in the City of Matlosana LM. Both were included as both could be seen as influential from or by the project. In order to provide context against which the ward's socio-economic profile can be compared, the socio-economic profiles (where available) of the Dr Kenneth Kaunda DM, North West Province, and South Africa as a whole 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, North West Draft Strategic Plan (2015), North West Spatial Development Framework (2016), Dr Kenneth Kaunda District Municipality Integrated Development Plan 2022 – 2027, Dr Kenneth Kaunda District Municipality Development Model: One Plan (2023), City of Matlosana Local Municipality Integrated Plan 2022-2027, City of Matlosana Spatial Development Framework (2021), and the JB Marks Integrated Development Plan 2022-2027.

4.7.1. 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 on, or benefit from, a particular project. 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, North West Province, Dr Kenneth Kaunda DM, City of Matlosana LM and JB Marks LM (Source: Census 2011, Community Survey 2016, Census 2022)

Census 2011, CS 2016, Census 2022	Area (km^2)	Population total			Population change from 2016 to 2022	Population density/km^2		
		2011	2016	2022		2011	2016	2022
South Africa	1 220 813	51 770 560	55 653 654	62 027 503	6 374 289	42.4	45.6	50.8
North West Province	105 235.1	3 509 953	3 748 435	3 804 779	56 344	33.4	35.6	36.2
Dr Kenneth Kaunda DM	14 759.4	695 933	742 822	734 203	-8 619	47.2	50.3	49.7
City of Matlosana LM	3 608.6	398 674	417 282	431 231	13 949	110.5	115.6	119.5
JB Marks LM	6 409.6	219 463	243 527	212 670	-30 857	34.2	38.0	33.2

The population growth rate from 2001-2011 was not included as the Census data is too outdated for the purpose of this report. A Census was conducted during 2021-2022 period, as of current some information has been released and where possible included within this report.

According to the Census 2022, revealed that the population of South Africa, North West Province and City of Matlosana LM had all increased from 2011 to 2022, while the Dr Kenneth Kaunda DM and JB Marks LM populations increased from 2011 to 2016 and decreased from 2016 to 2022. Specifically, the population of City of Matlosana LM grew from 417 282 in 2016 to 431 231 in 2022, an increase of 13 949 people. On the other hand, the JB Marks LM's population decreased from 243 527 people in 2016 to 212 670 people in 2022 aa decrease of 30 857 people. Consequently, the population density in the City of Matlosana LM increased from 115.6 people/km^2 in 2016 to 119.5 people/km^2 in 2022, while the population density of the JB Marks LM decreased from 38.0people/km^2 in 2016 to 33.2 people/km^2 in 2022.

4.7.2. 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 practises to utilise when engaging with the local communities (and whether different communication strategies should be adopted for different community groups).

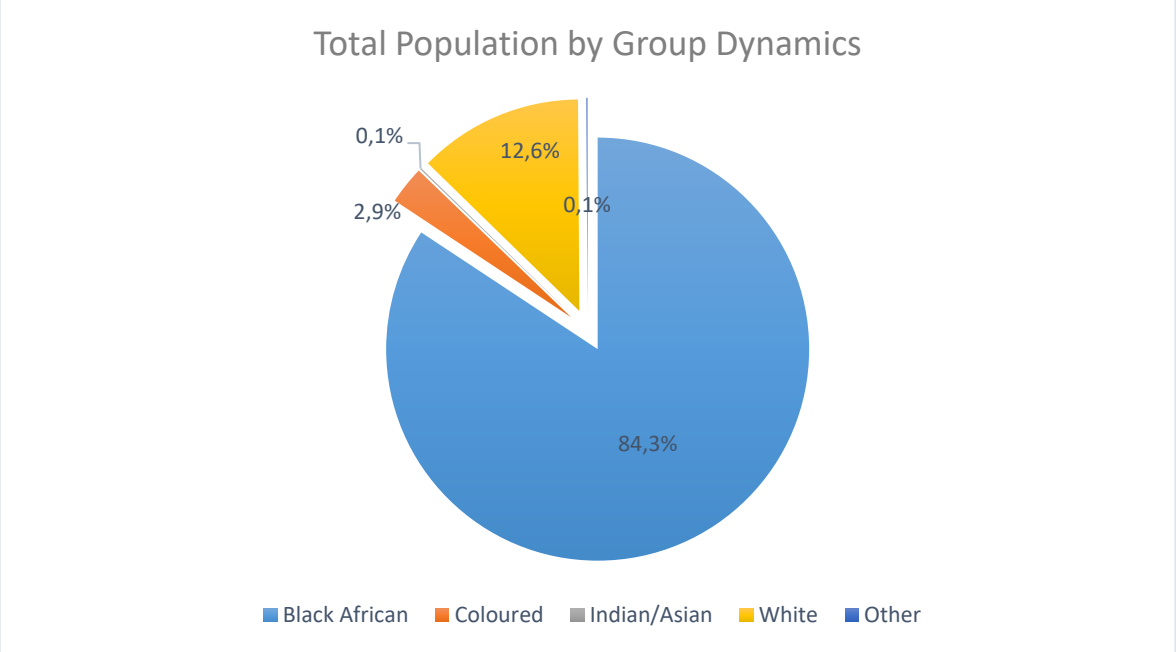

Figure 4.12: Total Population of the City of Matlosana LM by population group (Census 2022)

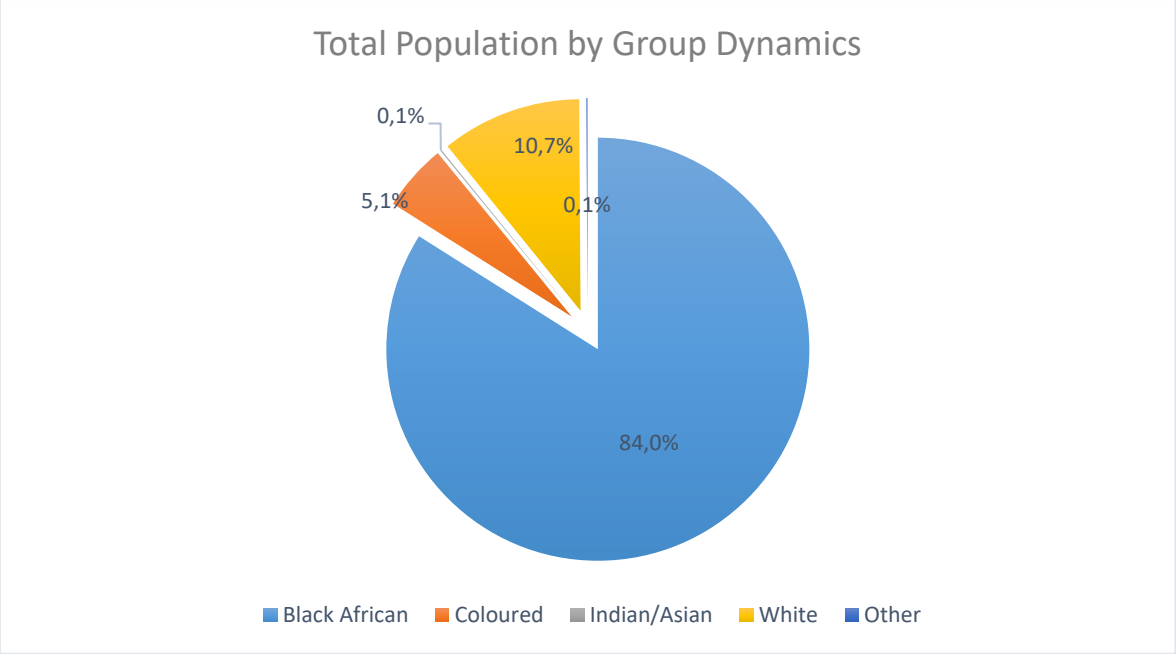

Figure 4.13: Total Population of the JB Marks LM by population group (Census 2022)

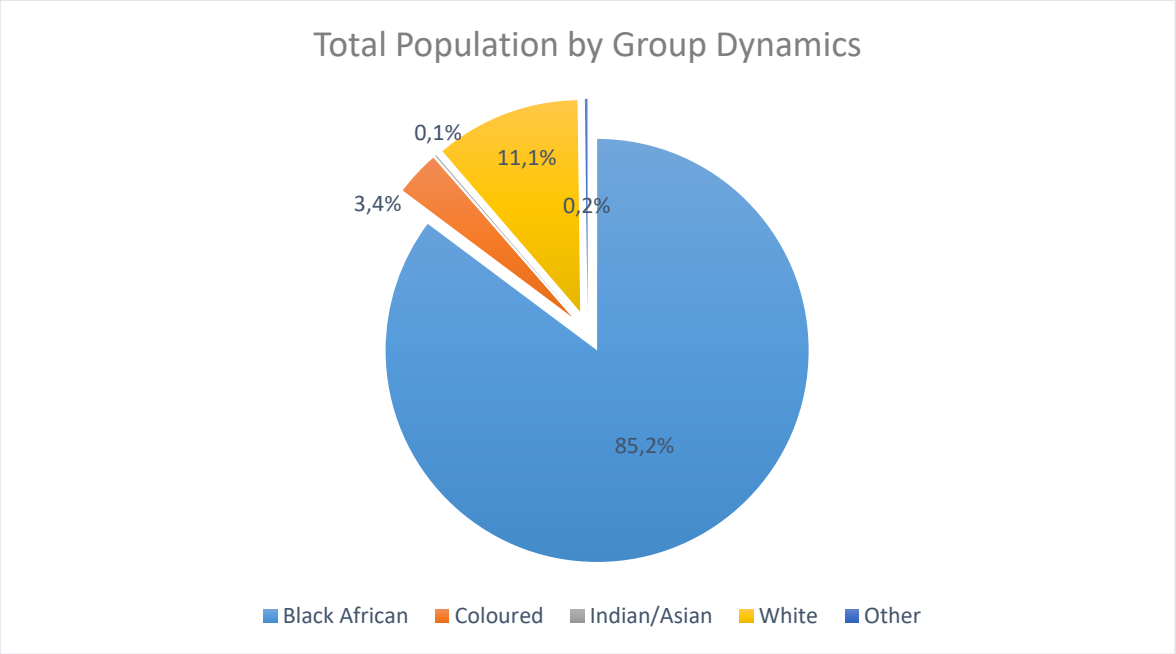

Figure 4.14: Total Population of the Dr Kenneth Kaunda DM by population group (Census 2022)

The Census 2022 data showed that the population of the City of Matlosana LM was predominantly composed of black Africans (84.3%), followed by the white population at 12.6%. Similarly, the JB Marks LM illustrated an 84.0% majority composed of black Africans, followed by the white population at 10.7%. Both local municipalities illustrated similar distributions than the Dr Kenneth Kaunda DM's population, with mostly black Africans, accounting for 85.2% of the population, while the white population made up 11.1% of the population. These group dynamics are comparable to those of the North West Province, specifically with a similar majority proportion of black Africans at 93.7%.

4.7.3. Gender Profile

The gender profile of a population has significance in terms of gender distribution and understanding the gender roles prevalent within the area. In the case of City of Matlosana LM, JB Marks LM, Dr Kenneth Kaunda DM, North West Province and South Africa all had female skewed distributions. In particular, the City of Matlosana LM had a 51.5% female and 48.5% male distribution and the JB Marks LM a 51.7% female and 48.3% male distribution. Refer to **Figure 4.15** illustrating the gender distribution of the five geographical areas.

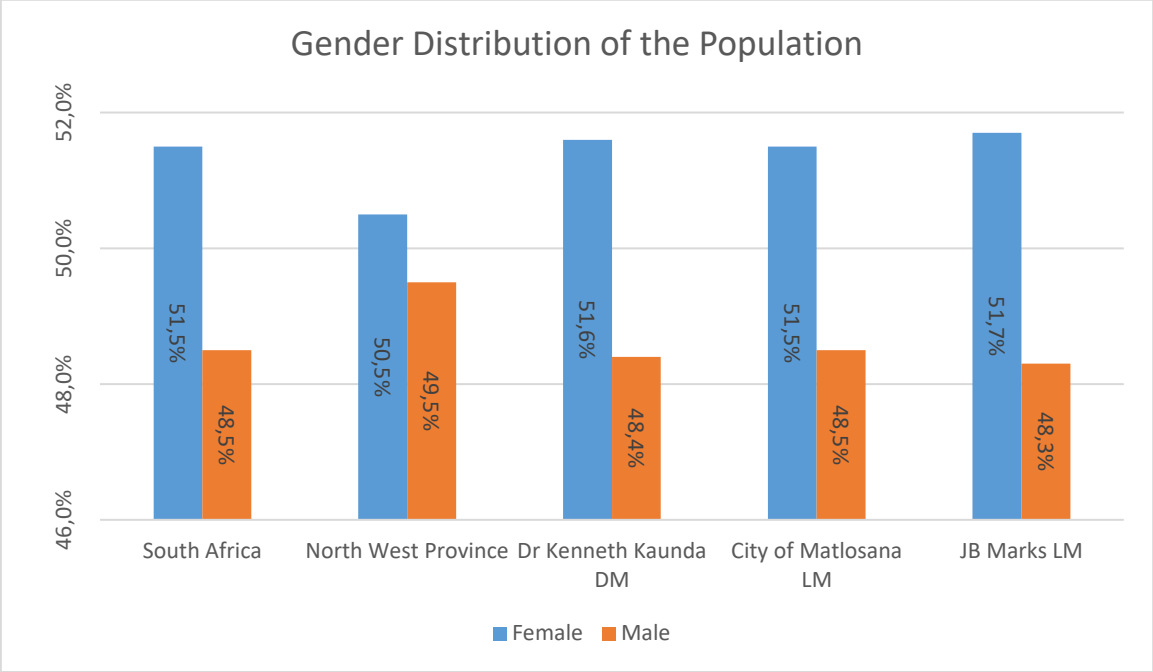

Figure 4.15: Population Distribution by Gender of South Africa, North West Province, Dr Kenneth Kaunda DM, City of Matlosana LM and JB Marks LM (Census 2022)

4.7.4. Age Profile

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

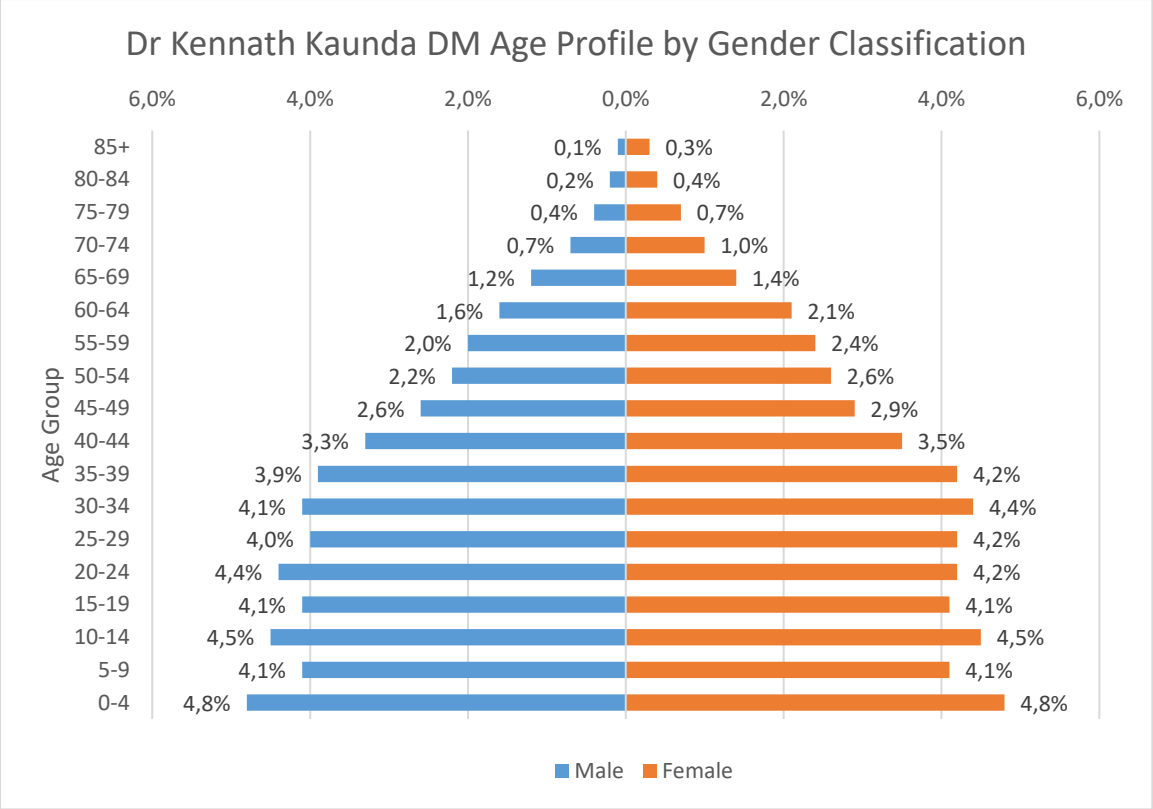

Figure 4.16: Dr Kenneth Kaunda DM Age and Gender Profile (Census 2022)

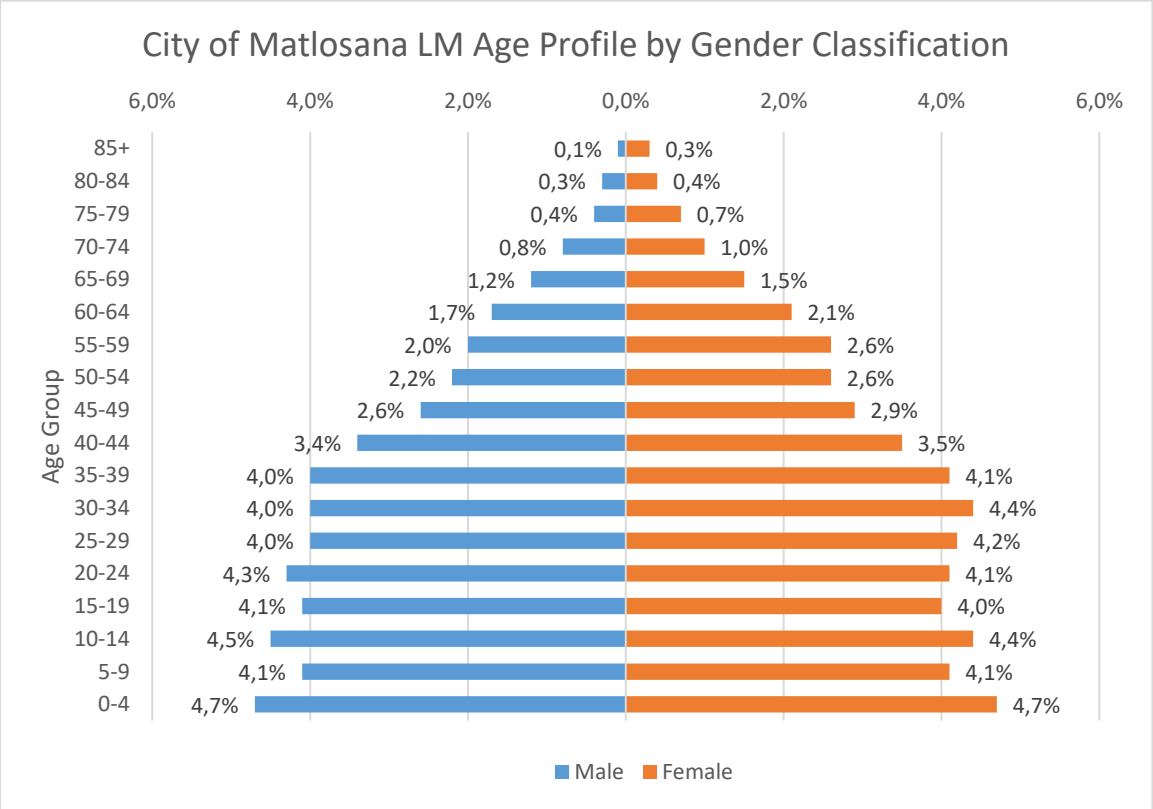

Figure 4.17: City of Matlosana LM Age and Gender Profile (Census 2022)

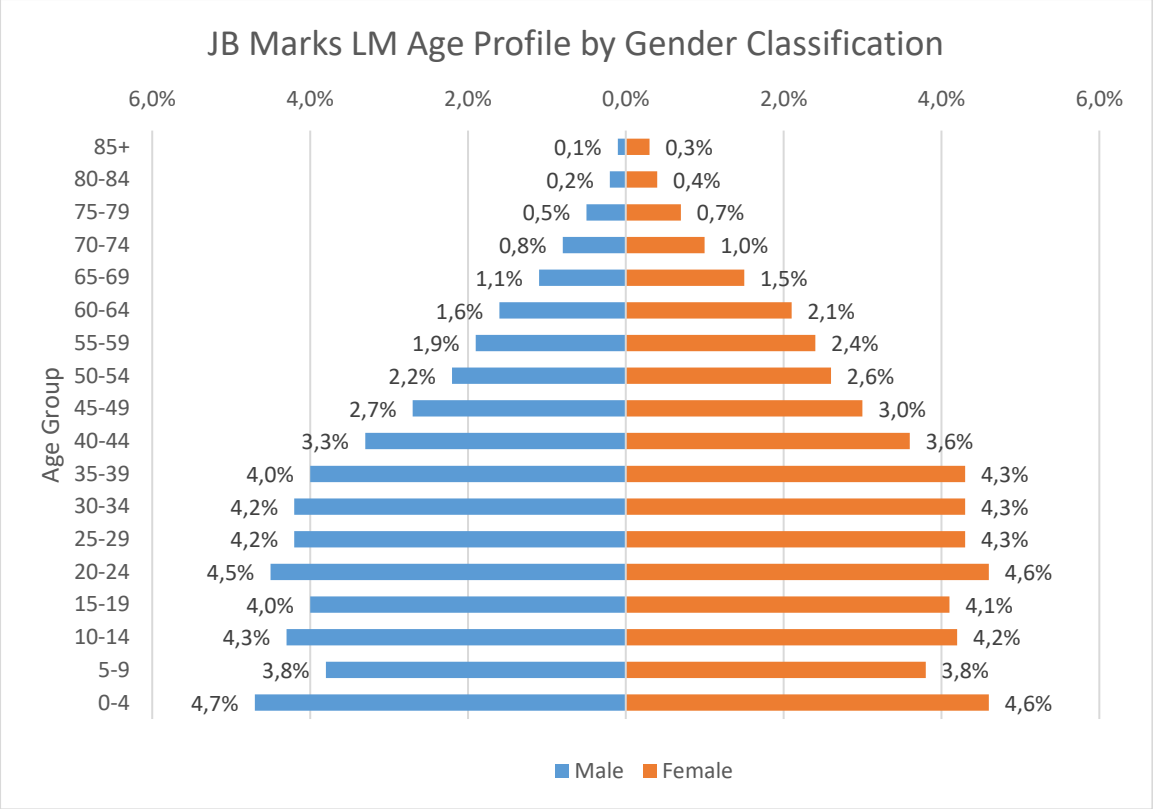

Figure 4.18: JB Marks LM Age and Gender Profile (Census 2022)

Based on the information from the Census conducted in 2022, it illustrates that both the Dr Kenneth Kaunda DM and City of Matlosana LM population pyramid has a wide base slowly narrowing to the top. This is a characteristic of a slowly expanding population. Additionally, some older age groups are greater in numbers than the younger age groups, which can be an indication in in and out migration of people in the regions. On the other hand, the JB Marks LM illustrate a population pyramid that has seen some decline in the younger age groups excluding the youngest age group. This is a characteristic of a declining population, as observed in the population sizes from 2011 towards 2022. Although it indicates a decline in population, the greater distribution among the youngest age group may be an indication towards a change in this trend towards a growing population.

Overall, the information provided suggest that the population of the regions are steadily growing and that there is a relatively large portion of young individuals. This could have implications on future demographic trends, such as changes in workforce demographics, demands on social services, and overall economic development.

4.7.5. Dependency Ratio

An area's dependency ratio provides an indication of that portion of the population which is dependent on the economically active portion of the population based on functional age groups. The dependent portion of the population typically comprises youth below 15 years of age which are yet to enter the workforce, and individuals 65 years and older which 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 ages between 15 and 64 years of age).

City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM experienced a decrease in their youth population (aged 0-14 years) from 2016 towards 2022, similarly all regions experienced an increase in their elderly population (population over 65). Specifically, the youth population of the City of Matlosana LM decreased from 29.2% in 2016 to 26.5% in 2022, and in the JB Marks LM it decreased from 28.2% towards 25.4%. On the older spectrum, the City of Matlosana LM elderly population increased from 4.8% to 6.7% and the JB Marks LM from 4.8% to 6.6%.

The dependency ratios decreased for City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM through a decrease in their population outside the age group of 15 and 65. The dependency ratio of the City of Matlosana LM stands at 33.2% in 2022 from 34.0% in 2016, implying that less than half of the population (33 individuals out of every 100) were considered dependant. Similarly, the dependency ratio of the JB Marks LM stands at 32.0% in 2022 from 33.0% in 2016, implying that less than half of the population (32 individuals out of every 100) were considered dependant. The dependency ratio Dr Kenneth Kaunda DM decreased from 34.6% in 2016 to 33.2% in 2016.

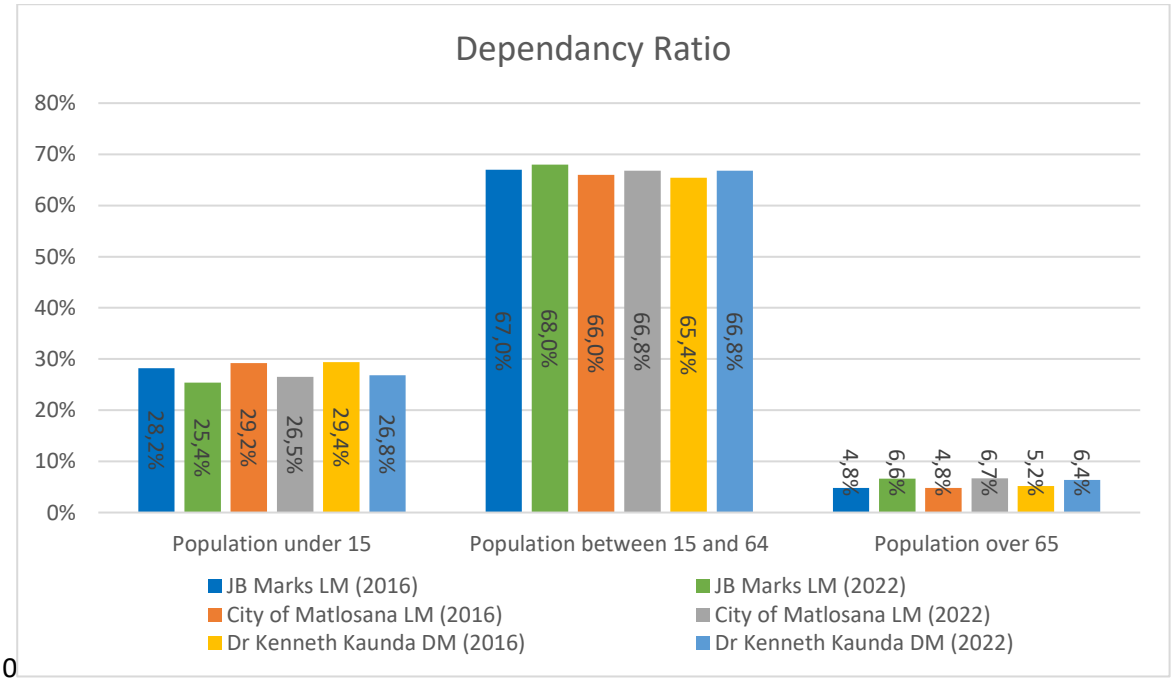

Figure 4.19: Dr Kenneth Kaunda DM, City of Matlosana LM and JB Marks LM Age Distribution (Census 2011, Community Survey 2016 and Census 2022)

The high proportion of potentially economically active persons within the City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM implies that there is a considerable human resource base for development projects to involve local population. The economically active population represents the largest proportion of the population, which means that focus needs to be placed on employment creation.

4.7.6. Education Level

Education plays a pivotal role in community development. The level of education influences 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.

In 2022, 6.3% of the population over the age of 20 in JB Marks LM had no schooling, which was a decrease from 8.9% in 2016. Additionally, an increase in the number of people completing matric, some secondary education and higher education levels was experienced from 2016 towards 2022. Specifically, the matric completion ratio increased from 32.4% to 35.1%.

The City of Matlosana experienced the same trends as in the JB Marks LM. The percentage of individuals completing matric increased from 31.0% to 34.2% and further to 37.3% during the same period intervals. Although, the second largest portion of the population only complete some secondary education at 35.5% in 2022.

In comparison, the Dr Kenneth Kaunda DM had 6.9% of its population classified within the no education class, and a 35.6% in 2022 completing matric compared to the 37.3%. Overall similar trends were observed within the JB Marks LM, City of Matlosana LM and Dr Kenneth Kaunda DM.

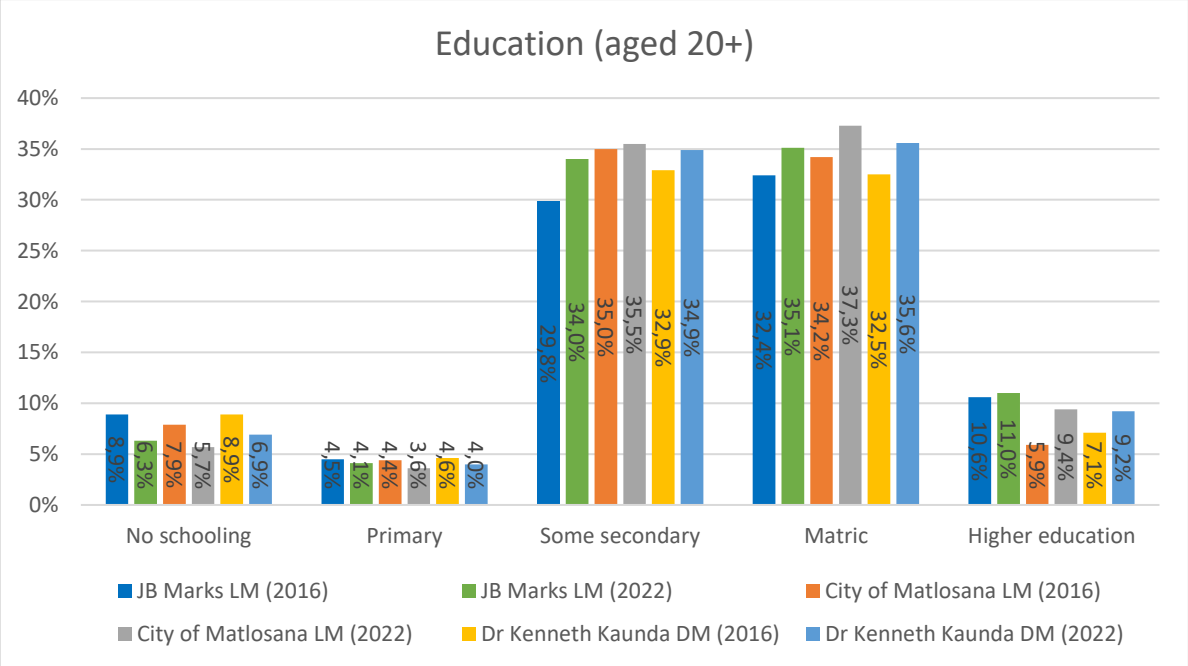

Figure 4.20:Dr Kenneth Kaunda DM, City of Matlosana LM and JB Marks LM Education Level (Community Survey 2016 and Census 2022)

4.7.7. Employment

The employment profile of an area is an important indicator of human development, as poverty and unemployment are closely correlated. The quality of 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. 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 (Census 2022 not yet available), the employment ratio in City of Matlosana LM was 40.4%, which is under half of the population. Similarly, the employment ratio in the JB Marks LM was slightly higher at 43.2%. The Dr Kenneth Kaunda DM and North West Province were similar at 40.4% and 37.1%. In the City of Matlosana LM and JB Marks LM, 35.7% and 40.4% of the population were not economically active and for unemployment the ratios were 19.6% and 12.7% respectfully. In comparison, the ratios for the Dr Kenneth Kaunda DM and North West Province not economically active population were similar at 38.3% and 40.2%, and for unemployment they were in between at 17.0% and 17.1%. The City of Matlosana LM, JB Marks LM, Dr Kenneth Kaunda DM and North West Province would benefit from additional job opportunities to reduce its dependency on social grants and pension.

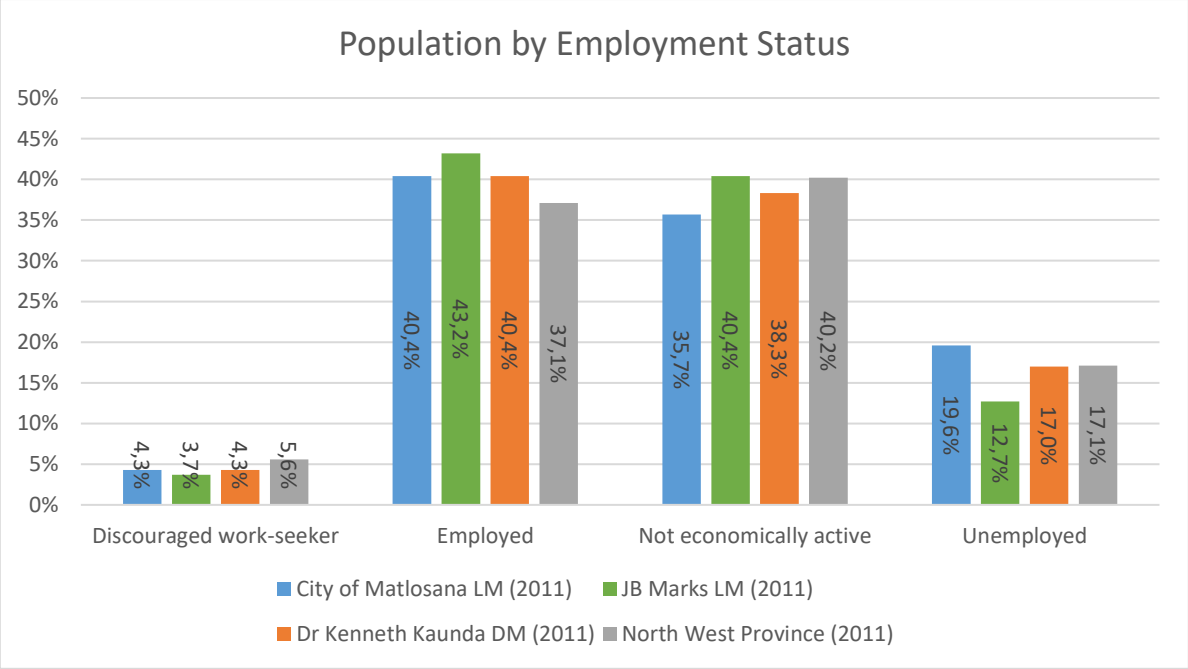

Figure 4.21: Employment Statistics for the City of Matlosana LM, JB Marks LM, Dr Kenneth Kaunda DM and North West Province (Census 2011)

4.7.8. Annual Household Income Levels

In order to determine the population's standard of living, as well as their ability to pay for basic services, the income levels of the employed population 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 to meet 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.

Figure 4.22 illustrates that 16.2% of households in City of Matlosana LM, 16.9% in the JB Marks LM and 16.3% in the Dr Kenneth Kaunda DM households had no income. The majority of households (18.3%) in City of Matlosana LM, 20.3% in the JB Marks LM and 19.4% in the Dr Kenneth Kaunda DM households had an annual income between R20 000 and R40 000. Households' annual income in the City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM were mostly similar through all classes.

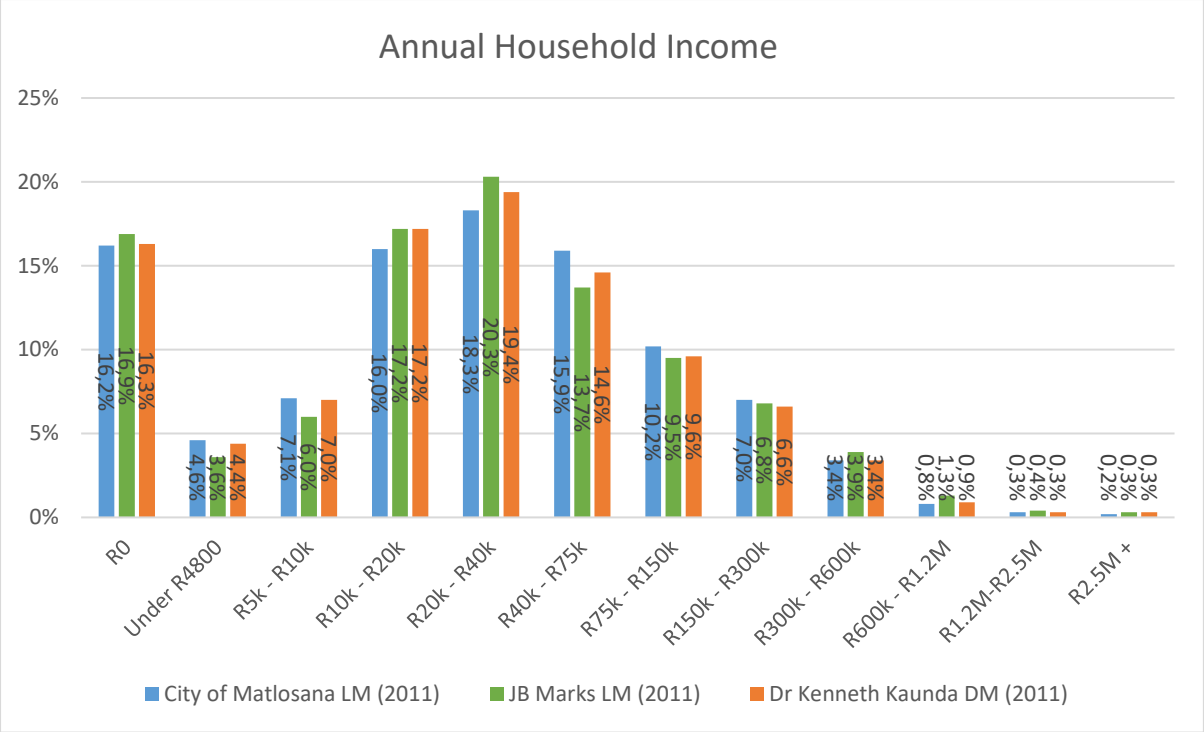

Figure 4.22: Annual Household Income for the City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM (Census 2011)

4.7.9. Economic Activities

According to the City of Matlosana IDP (2022), there has been a significant decline in employment opportunities related to mining activities. In particular, mining activities has been significantly downscaled from 2001. This has led to an increase in unemployment in the area. New developments in the region are centralised around the N12 national route connecting the east to the west of the country. In the case of JB Marks LM, most of the economic activity occurs within the community service sector followed by the financial sector.

4.7.10. Health

As stated in the City of Matlosana LM IDP (2022) the LM include 31 clinics, 10 community health centres, one district hospital, one regional hospital, one tertiary hospital and eight other healthcare facilities. Some wards mention the following health related problems; shortage of staff, limited access to mobile clinics, poor service and the shortage of medicine.

According to the JB Marks LM IDP 2022 – 2027, several sources of funding is made available from the Department of Health to revitalise existing health care facilities, including upgrades, maintenance, equipment and overall improvements.

4.7.11. Households

There were 128 358 households in the City of Matlosana LM in 2022, with the majority contributed by formal housing at 91.2% followed by informal dwellings at 8.1%. An improvement in housing standard were observed from 2016 to 2022 with the total number of informal dwellings decreasing from 9.4% to 8.1%, similarly the number of houses increased from 82.5% to 91.2%. Just under half of the

households in the City of Matlosana LM were owned and fully paid off at 49.7%in 2016, an increase from 45.7% in 2011. No data were available from the Census 2022 report for household tenure status.

According to the Census 2022 report there were 66 720 households in the JB Marks LM, of which 84.4% were classed as formal housing an increase from 82.1%. Informal dwellings have seen a decrease as within the Dr Kenneth Kaunda DM, with 14.7% in 2022 compared to 16.5% in 2016. Similar trends in the household tenure status were observed in the JB Marks LM as within the Dr Kenneth Kaunda DM, with the majority of households owned and fully paid off at 44.8%.

In comparison, Dr Kenneth Kaunda DM had 219 446 households in 2022, with houses making up the majority (89.3%), followed by informal dwellings at 9.9%. The majority (48.4%) of these households were owned and fully paid off in 2016. The average household size was 3.1 people per household in the City of Matlosana LM and a similar 3.1 people per households in the Dr Kenneth Kaunda DM in 2016.

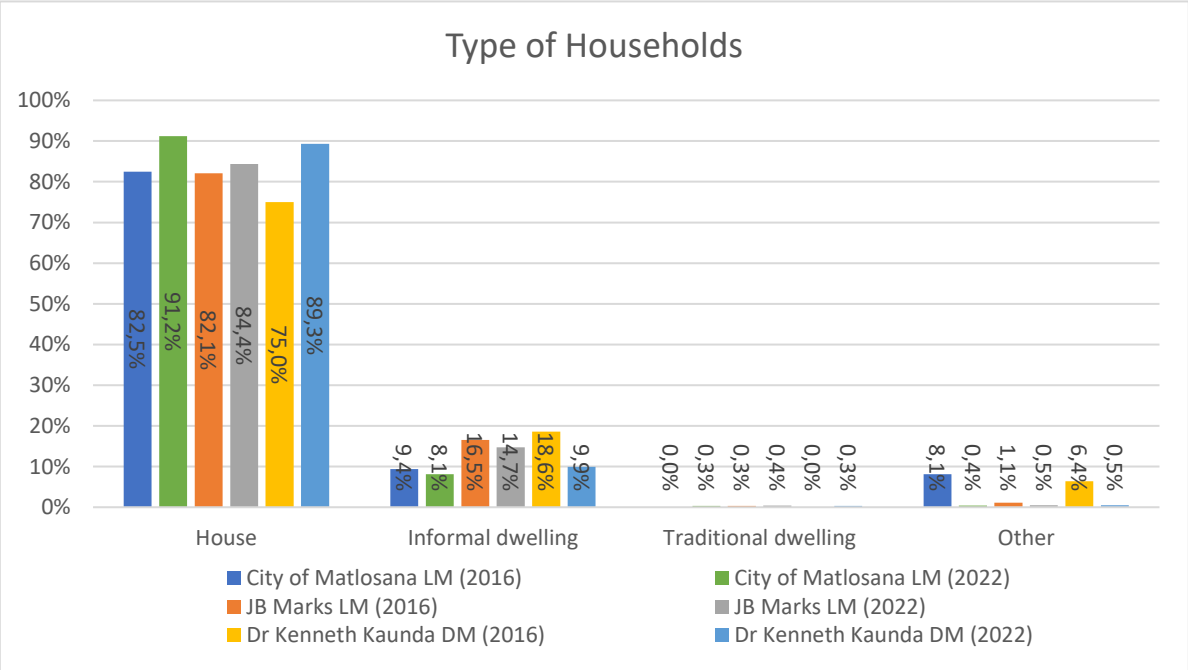

Figure 4.23: Households by type of dwelling in the Dr Kenneth Kaunda DM, City of Matlosana LM and JB Marks LM (Community Survey 2016 and Census 2022)

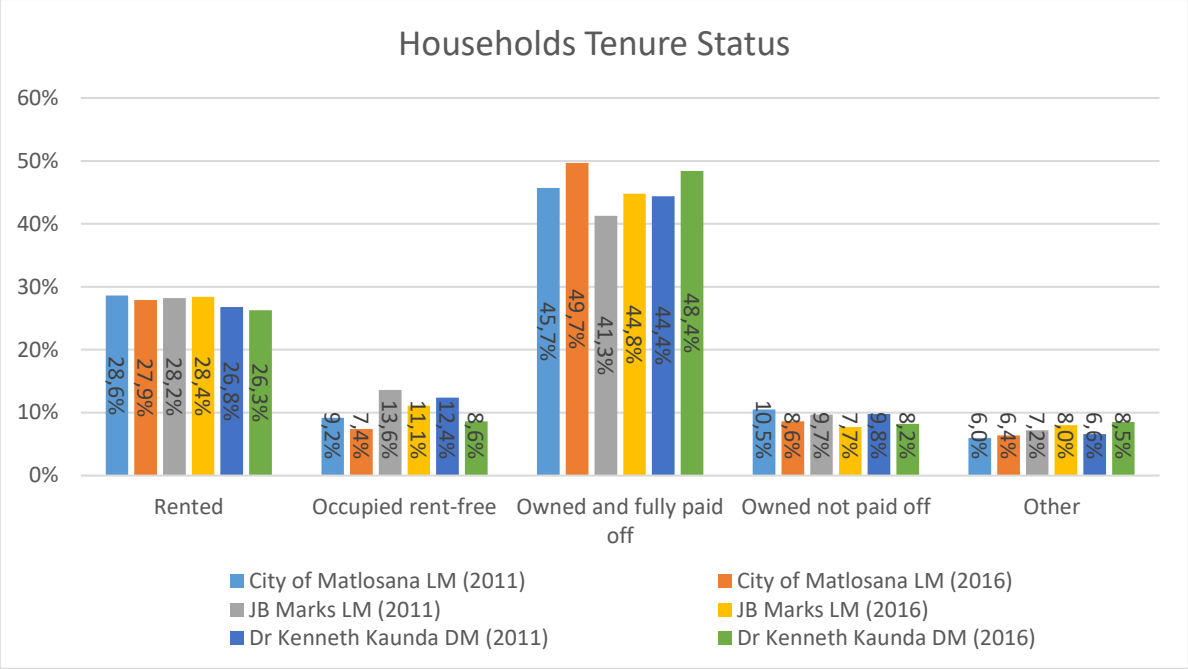

Figure 4.24: Households by tenure status in the Dr Kenneth Kaunda DM, City of Matlosana LM and JB Marks LM(Census 2011 and Community Survey 2016)

4.7.12. 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).

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 North West Province, Dr Kenneth Kaunda DM, JB Marks LM and City of Matlosana LM access to basic services is described in the following sub-section.

4.7.12.1. Access to Basic Services

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 to all its citizens.

According to the 2016 Community Survey, it was found that 85.2% of households in the City of Matlosana LM, 90.4% in the JB Marks LM, 87.6% in the Dr Kenneth Kaunda DM and 80.2% in the North West province had access to safe drinking water. Access to safe drinking water is significantly better than the rest of the regions.

The majority of households in the City of Matlosana LM (62.4%), JB Marks LM (57.7%) and Dr Kenneth Kaunda DM (58.4%) had access to piped water facilities within their houses, additionally all regions improved from 2016 towards 2022. The second most common water supply source were piped water inside their yards in all the regions, with 30.5% in the City of Matlosana LM, 30.7% in the JB Marks LM and 32.4% in the Dr Kenneth Kaunda DM. Overall, most households in the City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM has seen a reduction in the piped water inside their yards to more water facilities inside their homes.

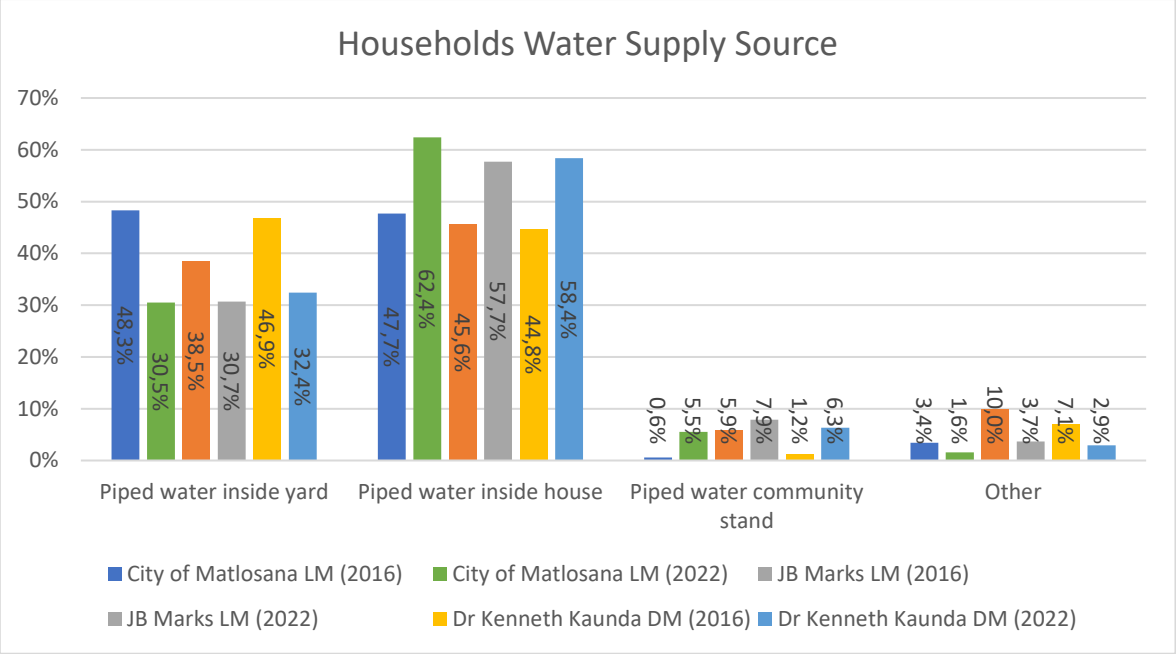

Figure 4.25: Households by main source of water supply for the Dr Kenneth Kaunda DM, City of Matlosana LM and JB Marks LM (Community Survey 2016 and Census 2022)

4.7.12.2. 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, all three regions majority of households had flushing toilet facilities although all has seen a decrease from 2016 towards 2022. Specifically, the City of Matlosana LM decreased from 95.7 to 92.3%, JB Marks LM from 80.3 to 80.2% and the Dr Kenneth Kaunda DM from 90.0% to 88.3%. Subsequently, it was observed that pit latrines have increased during this period.

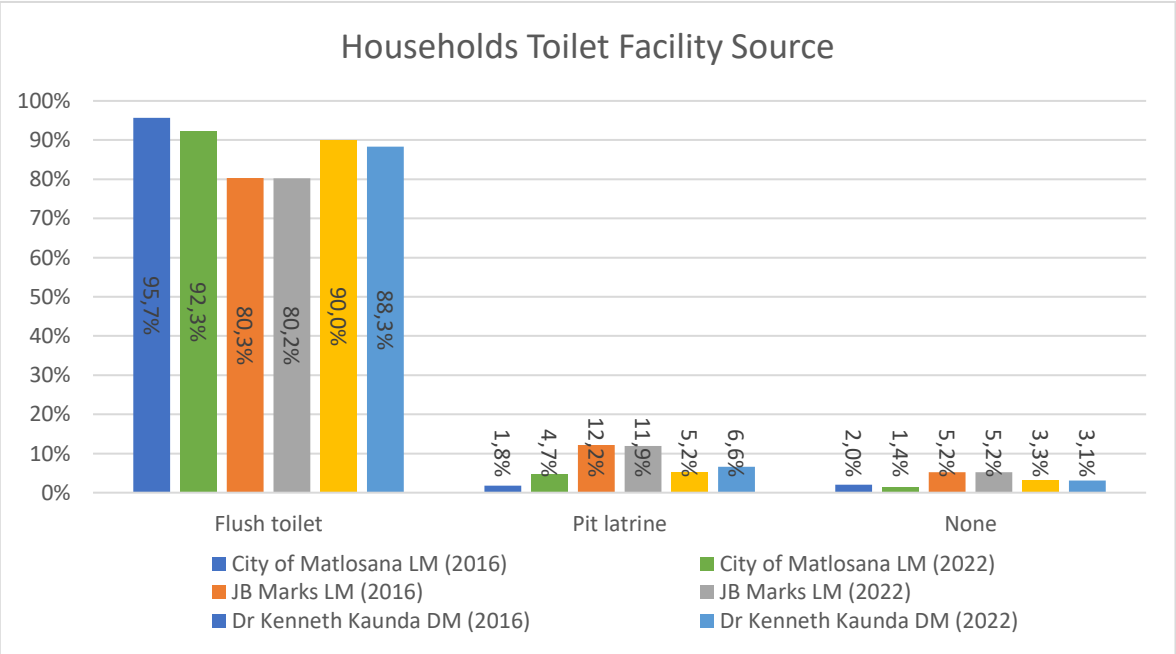

Figure 4.26: Households by main source of toilet facility for the Dr Kenneth Kaunda DM, City of Matlosana LM and JB Marks LM (Community Survey 2016 and Census 2022)

4.7.12.3. Access to Electricity

Energy is required for cooking, heating, and lighting purposes. 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.

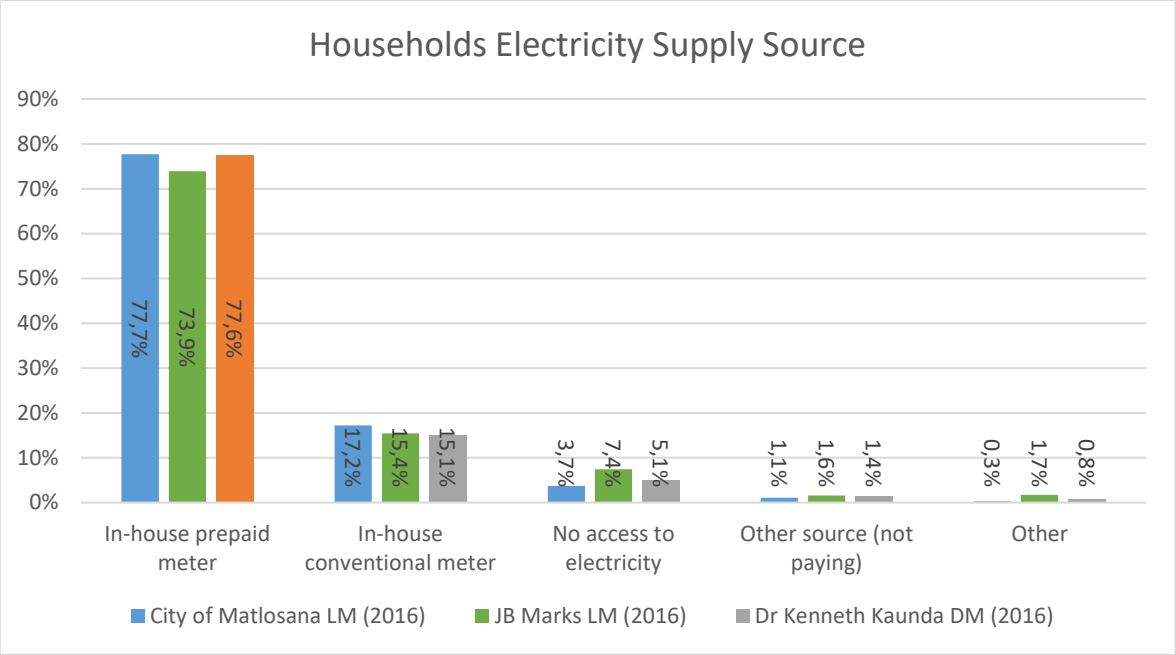

Figure 4.27: Energy sources for households in the City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM (Community Survey 2016)

According to the Community Survey 2016, 94.9% of households in the City of Matlosana LM, 89.3% in the JB Marks LM and 92.7% in the Dr Kenneth Kaunda DM had access to in-house prepaid or conventional meters for electricity. No access to electricity were lowest in the City of Matlosana LM at 3.7% than the high 7.4% in the JB Marks LM, while in the Dr Kenneth Kaunda DM 5.1% of households had no access to electricity. Some households in the City of Matlosana, JB Marks LM and Dr Kenneth Kaunda DM obtained their electricity from sources not paid for, this may be illegal connections which could lead to significant health risks.

The Census 2022 data review electricity supply in a different manner than in 2016. The data indicate that 73.2% of households in the City om Matlosana LM used energy as a source for cooking and 92.9% for lighting. In the JB Marks LM, 60.9% of households used electricity as their main source for cooking and 89.8% for lighting in their households. The ratios for the Dr Kenneth Kaunda DM were 69.5% for cooking and 92.1% for lighting in these households.

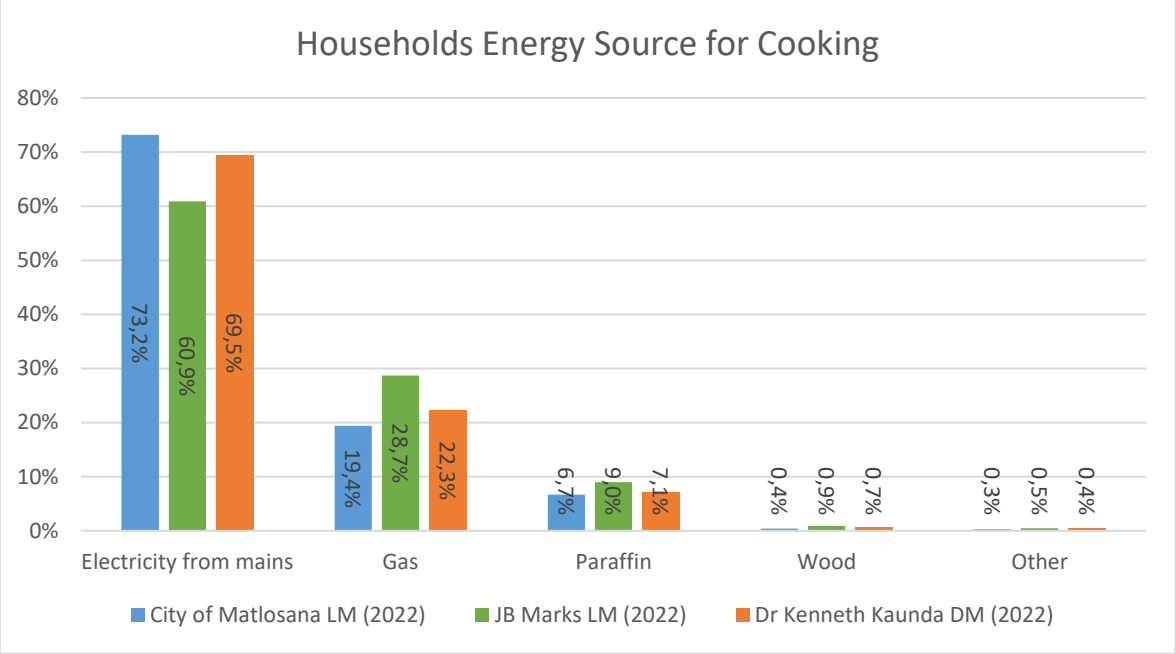

Figure 4.28: Energy sources for cooking in the City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM (Census 2022)

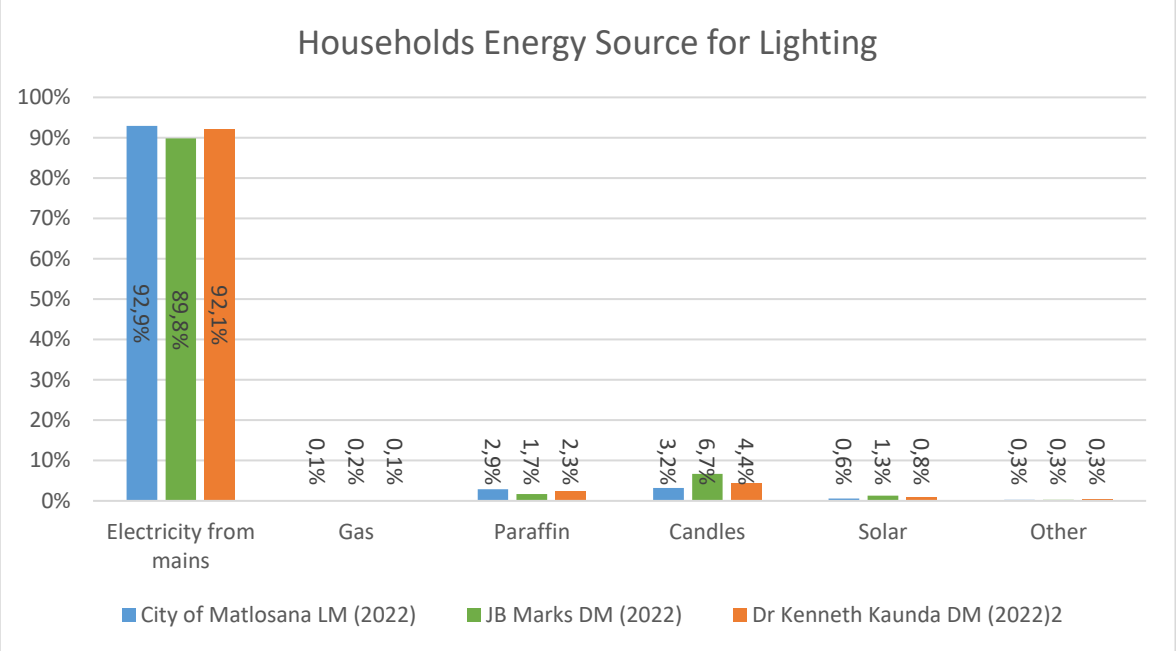

Figure 4.29: Energy sources for lighting in the City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM (Census 2022)

4.7.12.4. Access to Refuse Removal

In 2022, the majority of households in City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM had access to regular refuse removal through a service provider. Specifically, the City of Matlosana saw a decrease from 92.6% in 2016 to 86.4% in 2022, while the JB Marks LM saw a slight increase from 73.0% to 75.1%. Own dumping facilities were higher in the JB Marks LM at 13.4% and Dr Kenneth Kaunda DM at 10.5% respectively, than the City of Matlosana LM at 5.4% due to greater regions consisting of agricultural lands.

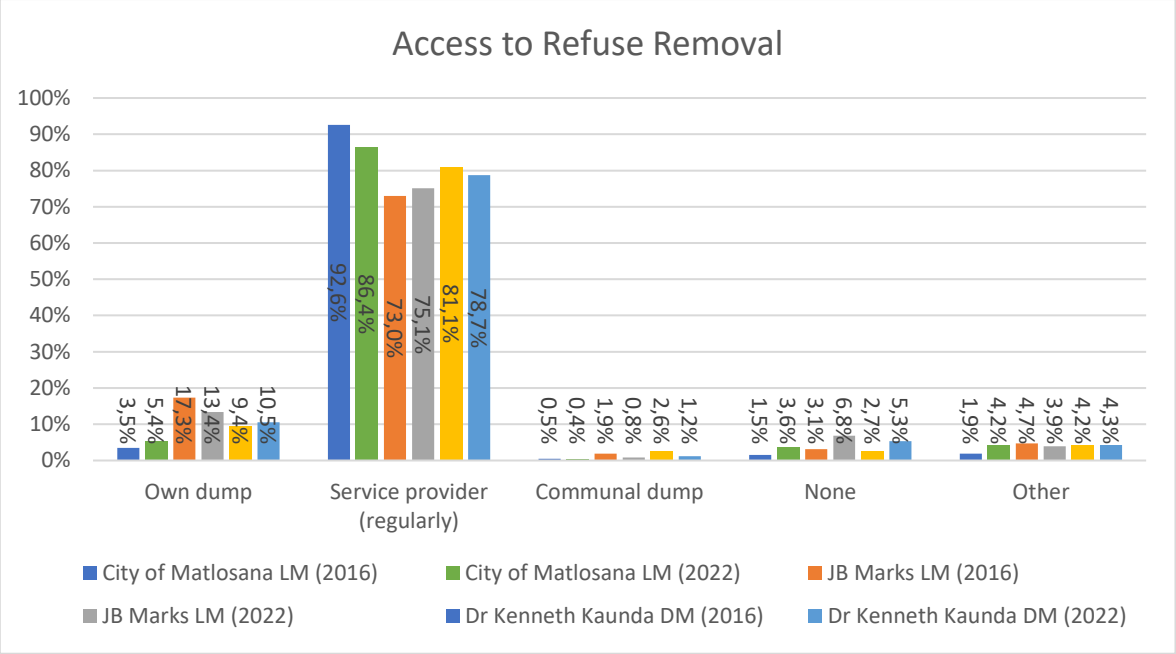

Figure 4.30: Access to refuse removal for City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM (Community Survey 2016 and Census 2022)

Baseline Summary

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

- The proposed project is located in the City of Matlosana LM and JB marks LM, both of which are subdivisions of the greater Dr Kenneth Kaunda DM situated within the North West Province.
- The City of Matlosana LM and JB Marks LM are both Category B municipalities within the Dr Kenneth Kaunda DM, with the first situated in the south-eastern part of the district and the second situated in a similar location adjacent to each other. The Dr Kenneth Kaunda DM is situated in the south-eastern part of the North West Province.
- The proposed project is situated 22km east of the town of Klerksdorp, the proposed project spans over two local municipalities; the JB Marks LM and City of Matlosana LM, both subdivisions of the Dr Kenneth Kaunda DM in the North West Province.
- According to the Census 2022, Community Survey 2016 and Census 2011, the City of Matlosana LM, North West Province and South Africa all experienced population growth from 2011 towards 2022. On the other hand, the population growth in the Dr Kenneth Kaunda DM and JB Marks LM saw an increase from 2011 towards 2016 and decrease towards 2022. The current population total of the City of Matlosana LM stands at 734 204 people and at 212 670 people in the JB Marks LM.
- Black Africans were the majority of the population group dynamics in the City of Matlosana LM (84.3%), JB Marks LM (84.0%), Dr Kenneth Kaunda DM (85.2%) and North West Province (93.7%). The second most popular population group in all the regions were the white population.
- The gender profile of the City of Matlosana LM, JB Marks LM, Dr Kenneth Kaunda DM, North West Province and South Africa were all female skewed.

- The City of Matlosana LM and Dr Kenneth Kaunda DM both illustrate a slow expansive population pyramid with a wide base slowly narrowing towards the top. On the other hand, the JB Marks LM illustrate a population pyramid that has seen some decline in the younger age groups excluding the youngest age group. This is a characteristic of a declining population, that might be turning around in the future.
- From 2016 towards 2022, the City of Matlosana LM, JB Marks LM and Dr Kenneth Kaunda DM all experienced a decrease in their youth population and increase in elderly population. As a result, a reduction in dependency ratios was observed for all regions. The current dependency as of 2022 were 33.2% for the City of Matlosana LM, 32.0% for the JB Marks LM and 34.6% for the Dr Kenneth Kaunda DM.
- The JB Marks LM, City of Matlosana LM and Dr Kenneth Kaunda DM have seen similar educational trends, all regions have seen a decline in their no schooling ratios and increase in some secondary and matric completion ratios. The matric completion ratios were the highest education classification for all three regions.
- According to the Census 2011, under half of the JB Marks LM, City of Matlosana LM, Dr Kenneth Kaunda and North West Province populations were employed with the JB Marks LM at the highest of 43.2% and the North West Province the lowest at 37.%. The dependency was high in the JB Marks LM and City of Matlosana LM with unemployment ratios of 12.7% and 19.6%, and not economically active ratios of 40.4% and 35.7%.
- The majority of households in the JB Marks LM (20.3%), City of Matlosana LM (18.3%) and Dr Kenneth Kaunda DM (19.4%) earned an annual income between R20 000 and R40 000. A total of 16.9% in the JB Marks LM, 16.2% in the City of Matlosana LM and 16.3% in the Dr Kenneth Kaunda DM had no annual households' income.
- According to the City of Matlosana IDP (2022), there has been a significant decline in employment opportunities related to mining activities. In particular, mining activities has been significantly downscaled from 2001. This has led to an increase in unemployment in the area. New developments in the region are centralised around the N12 national route connecting the east to the west of the country. In the case of JB Marks LM, most of the economic activity occurs within the community service sector followed by the financial sector
- As stated in the City of Matlosana LM IDP (2022), wards mention the following health related problems; shortage of staff, limited access to mobile clinics, poor service and the shortage of medicine. While minimal information is mentioned in the JB Marks LM IDP 2022-2027, with the exception that funding has been made available for the revitalise existing health care facilities, including upgrades, maintenance, equipment and overall improvements.
- The majority of households in the JB Marks LM (84.4%), City of Matlosana LM (91.2%) and Dr Kenneth Kaunda DM (89.3%) were classified as formal housing, with the observation of informal dwellings in each region decreasing from 2016 towards 2022. The majority of households in each region were owned and fully paid off.
- According to the 2016 Community Survey, it was found that 85.2% of households in the City of Matlosana LM, 90.4% in the JB Marks LM, 87.6% in the Dr Kenneth Kaunda DM and 80.2% in the North West province had access to safe drinking water.
- Over half of the households in the JB Marks LM (57.7%), City of Matlosana LM (62.4%) and Dr Kenneth Kaunda DM (58.4%) had piped water facilities within their homes, this was followed

by piped water facilities within their yards. All three regions have seen a rise in piped water facilities within their homes and a decrease in piped water facilities inside their yards.

- Flushing toilet facilities were the most common in the JB Marks LM (80.2%), City of Matlosana LM (92.3%) and Dr Kenneth Kaunda DM (88.3%), although all three regions have seen a decline in flushing toilet facilities which ultimately lead to an increase in pit latrines.
- No access to electricity were the lowest in the City of Matlosana LM at 3.7% and the highest in the JB Marks LM at 5.1%. The majority of households in the JB Marks LM (89.3%), City of Matlosana LM (94.9%) and Dr Kenneth Kaunda DM (92.7%) had access to electricity either through prepaid or conventional meters.
- The majority of households in all three regions made use of electricity for their cooking and lighting sources, although a mention can be made to the use of gas as a source of energy for cooking in all three regions.
- The majority of households in the JB Marks LM (75.1%), City of Matlosana LM (86.4%) and Dr Kenneth Kaunda DM (78.7%) had access to a regular refuse removal service provider, although the City of Matlosana LM and Dr Kenneth Kaunda DM have seen a decrease in regular refuse removal by a service provider from 2016 to 2022. Own dumping facilities were higher in the JB Marks LM and Dr Kenneth Kaunda DM than in the City of Matlosana LM due to greater regions classified as agricultural regions.

5. KEY CONSIDERATIONS FOR BATTERY ENERGY STORAGE SYSTEM FACILITIES

While no industry sector Environmental, Health and Safety (EHS) Guidelines have been developed for BESS facilities, key considerations can be identified from the combination of the article "Large-scale energy storage system: safety and risk assessment" and the International Finance Corporation (IFC) publication on a Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (IFC, 2015). 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 BESS facilities can be associated with similar renewable/ alternative energy projects such as PV facilities. Key considerations for BESS facilities are provided below.

5.1. 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.

5.2. Water Usage

Adequate provision of water will be a prerequisite for the development. Water for the proposed development will most likely be obtained from ground water resources, or from the local municipality and/or a water service provider. A large amount of water will be needed during the construction and operational phases of the project.

5.3. Land Matters

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. If 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.

No involuntary land acquisitions are foreseen for the purpose of this project.

5.4. Landscape and Visual Impacts

Key impacts can include the visibility of the BESS facilities 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.

5.5. 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. Ecological baseline surveys should be carried out where potentially sensitive habitat, including undisturbed natural habitat, is to be impacted, to determine key receptors of relevance to each site. Mitigation measures can include careful site layout and design to avoid areas of high ecological value or translocation of valued ecological receptors. Habitat enhancement measures could be considered where appropriate to offset adverse impacts on sensitive habitat at a site, though avoidance of such habitats is a far more preferable option.

5.6. 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. Where indicated as a potential issue by the initial environmental review / scoping study, field surveys should be carried out prior to construction to determine key heritage and archaeological features at, or in proximity to, the site. Mitigation measures can include careful site layout and design to avoid areas of cultural heritage or archaeological value and implementation of a ‘chance find’ procedure that addresses and protects cultural heritage finds made during a project’s construction and/or operation phases.

5.7. Tourism

Potential impacts on tourism might be positive and negative. Tourism or lodging facilities in an area might benefit from guests 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. Further mitigation may include the development of a tourist programme to attract tourists to the area.

5.8. 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.

5.9. 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.

5.10. 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.

5.11. Safety hazards

Common safety hazards associated with BESS facilities include fire hazards, chemical release, physical impacts and electrical hazards. Thermal runaway is a condition where the temperature of a substance undergoes uncontrolled and swift escalation, driven by a self-amplifying mechanism. This phenomenon typically arises when the heat produced within a system exceeds its capacity to disperse or expel heat, triggering a positive feedback loop that intensifies the temperature surge. Experiencing fire hazards as a result of safety hazard should include stringent fire safety measures, an emergency response management plan and a risk management plan.

5.12. Environmental Management Plan (EMP)

Whether or not an EIA has been completed for the site, an EMP 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 EMP 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.

6. SOCIAL 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 Kareerand BESS facility.

6.1. Design and Construction Phase

The design and construction phase are expected to take up to 18 months to complete. It is anticipated that the following activities would be included and would form part of the detailed design and construction phase:

- **Pre-planning:** Several post-authorisation factors are expected to influence the final design of the facility and could result in small-scale modifications of the positioning of the BESS facility and / or associated infrastructure. The construction process is dynamic and unforeseen changes to the project specifications may occur. The final facility design is required to be approved by competent authority prior to any construction activities commencing on-site. Should any substantive changes or deviations from the original scope or layout of the project reflected in the EIA process occur, the competent authority would need to be notified thereof, and where applicable additional approval may need to be obtained.
- **Conduct surveys**: Prior to initiating construction, several surveys will be required. These include, but are not limited to confirmation of the micro-siting footprint (i.e., confirming the precise location of the BESS facility and associated infrastructure), and a geotechnical survey, as well as any other surveys that may be required.
- **Procurement and employment**: At the peak of construction the project is likely to create up to 100 employment opportunities. These employment opportunities will be temporary and will last for a period of up to 18 months (i.e., the length of construction). Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled opportunities. BESS facility projects make use of large numbers of unskilled and semi-skilled labour so there will be 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. Most of the labour force is expected to be sourced from the surrounding towns. No labourers will be accommodated on-site during the construction period.
- **Establishment of an access road to the site:** Access will be obtained from the district road off of the R502 regional road. There will be a service road for direct access to the facility from the secondary road. The access and internal roads will be constructed within an 8-meter corridor. The final layout will be determined following the identification of site related sensitivities.
- **Undertake site preparation:** Site preparation activities will include clearance of vegetation. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and / or spread on site.
- **Transport of components and equipment to site:** The national, regional, secondary and proposed internal access roads will be used to transport all components and equipment

required during the construction phase of the solar facility. Some of the components (i.e., substation transformer) may be defined as abnormal loads in terms of the National Road Traffic Act (No. 93 of 1996) (NRTO) by virtue of the dimensional limitations. Typical civil engineering construction equipment will need to be brought to the site (e.g., excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the alternative energy solution support structures, construction of the substation and site preparation.

- **Establishment of laydown areas on site:** Laydown and storage areas will be required for typical construction equipment. Once the required equipment has been transported to site, a dedicated equipment construction camp and laydown area will need to be established adjacent to the workshop area. The equipment construction camp serves to confine activities and storage of equipment to one designated area to limit potential impacts associated with this phase of development. The laydown area will be used for the assembly of the BESS facility and the general placement / storage of construction equipment.
- **Construct substation and invertors:** The construction phase involves installation of the BESS facility and structural and electrical infrastructure required for the operation of the facility. In addition, preparation of the soil and improvement of the access roads is likely to continue for most of the construction phase. Trenches are dug for the underground AC and DC cabling and the foundations of the inverter enclosures and transformers are prepared if necessary. Underground cables and overhead circuits connect the Power Conversion Stations (PCS) to the on-site AC electrical infrastructure and ultimately the BESS facility's onsite substation. The construction of the substation will require a survey of the site, site clearing and levelling and construction of access road(s) (where applicable), construction of a level terrace and foundations, assembly, erection, installation and connection of equipment, and rehabilitation of any disturbed areas, and protection of erosion sensitive areas.
- **Establishment of ancillary infrastructure:** Ancillary infrastructure will include workshop, storage and laydown areas, gatehouse and security complex, as well as a temporary contractor's equipment camp. The establishment of the ancillary infrastructure and support buildings will require the clearing of vegetation and levelling of the development site, and the excavation of foundations prior to construction. Laydown areas for building materials and equipment associated with these buildings will also be required.
- **Undertake site rehabilitation:** Once construction is completed and all construction equipment has been removed, the site will be rehabilitated where practical and reasonable. In addition, on full commissioning of the BESS facility, any access points which are not required during operation must be closed and rehabilitated accordingly.

The majority of social impacts associated with the project are anticipated to occur during the construction phase of development and are typical of the type of social impacts generally associated with construction activities. Impacts associated with the design and construction phase of a project are usually of a 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 so as not to result in permanent impacts associated with the ill placement of project components or associated infrastructure. The assessment

of associated impacts identified with the construction phase of Kareerand BESS facility is presented in **Table 6.1**.

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

6.1.1. Construction Phase Impacts Associated with Kareerand BESS facility

6.1.1.1. Direct and indirect employment opportunities and skills development

It is anticipated that at its peak the construction of the proposed project will result in the creation of up to 100 employment opportunities. Of those employment opportunities likely to be generated, approximately 60% will accrue to low skilled workers, 25% to semiskilled workers, and 15% 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 (i.e., up to 18 months), 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. Alternative energy solution projects make use of large numbers of unskilled and semi-skilled labour so there will be 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.

In addition to direct employment opportunities associated with the construction of the project, a number of indirect employment opportunities will also be created. Indirect employment opportunities will predominantly be created in the service industry, through the opportunity for the provision of secondary services to the construction team. Services may include for example accommodation, catering, and laundry services. Indirect employment opportunities created as a result of the construction of the project would also be temporary in nature and would last for the duration of the construction period (i.e., up to 18 months). While difficult to quantify, indirect employment opportunities are significant in that they provide greater opportunity for women to be included and benefit, albeit indirectly. Other indirect employment opportunities that will be created during construction relate to increased demand for transportation, equipment rental, sanitation and waste removal etc. which may benefit local service providers. The creation of employment opportunities is considered to be of moderate magnitude given the levels of unemployment within the area and the low average income.

Enhancement:

- 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.

No-Go Alternative:

- 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.

Cumulative impacts:

- Opportunity to decrease the local unemployment levels and increase the levels of income and spending power within the region.
- Opportunity to upgrade and improve skills levels in the area.
- Opportunity for local entrepreneurs to develop their businesses (which could result in the creation of additional employment opportunities, levels of income and spending power through sustainable growth).

Residual impacts:

- Improved pool of skills and experience in the local area.
- Economic growth for small-scale entrepreneurs.
- Temporary employment during the construction phase will result in job losses and struggles for construction workers to find new employment opportunities.

6.1.1.2. Economic Multiplier effect

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 is 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 business 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 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 business and local economic development. There is likely to be a direct increase in industry and 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 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 (i.e., up to 18 months).

Enhancement:

- 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.

No-Go Alternative:

- 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 lost injection of income into the area.

Cumulative impacts:

- Opportunity for local capital expenditure which has the potential to benefit the local service sector.

Residual impacts:

- Improved local service sector which will result in a growth in local business.

6.1.1.3. Potential loss of productive farmland

A negative impact identified for the construction phase is the potential 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 Kareerand BESS facility is used for the grazing of livestock and game.

Mitigation:

- The proposed site for the Kareerand BESS facility 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.
- All affected areas outside the development footprint, which are disturbed during the construction phase, need to be and should be continuously monitored by the Environmental Control Officer (ECO).
- 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.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative Impacts:

- The cumulative impacts associated with the loss of productive farmland is the effect it has on the livelihoods of the farmers, their families and also the workers on the farms and their families. As indicated above this impacted can be mitigated.

Residual impacts:

- The residual impacts for the potential loss of productive farmland are the overall loss of grazing for livestock or game.

6.1.1.4. Influx of jobseekers and change in population

Construction projects have the potential to attract jobseekers which 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. Population change refers to the size, structure, density as well as demographic profile of the local community.

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. It could also potentially create conflict between locals and outsiders due to potential differences in racial, cultural and ethnic composition. A further negative impact that could result due to an influx of jobseekers into an area is an increase in unemployment levels due to an oversupply of available workforce, particularly with respect to semi and unskilled workers.

Given the relatively large labour force required for the project (i.e., up to 100 employment opportunities at the peak of construction), the short duration of the construction period (i.e., up to 18 months), 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.

Mitigation:

- 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.
- Appoint a security company and implement appropriate security procedures to ensure that workers do not remain onsite after working hours.
- Inform 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.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative Impacts:

- Additional pressure on natural resources, services, infrastructure and social dynamics in the area due to an increase in people and change in population.
- Possible increase in criminal activities and economic losses in area for property owners.
- In the case of HIV/AIDS or unwanted pregnancies the impacts might be permanent and have permanent cumulative impacts on the affected individuals, families and the community.

Residual impacts:

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

6.1.1.5. Safety and security impacts

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 veld fire, stock theft, poaching, crime and so forth. All landowners have raised concerns regarding security in the area and have reiterated that crime in the area should not increase as a result of the project. A concern was raised regarding the location of the access to the site and the potential to open up the area as a thoroughfare.

Given the fact that a man camp will not be established onsite, 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.

The project proponent should strive to develop and maintain good relationships and ongoing and open communication with neighbouring landowners. Suitable grievance control mechanisms must be developed and implemented, and the local community informed of the grievance mechanism to be

followed. In addition, a security company must be appointed, and appropriate security measures implemented prior to the commencement of construction activities onsite.

Mitigation:

- 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.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative impacts:

- Possible increase in crime levels (with influx of people) with subsequent possible economic losses.
- Increased risk of veld fires if vegetation clearing is not appropriately implemented, monitored and maintained.

Residual impacts:

- Possible financial losses for adjacent landowners.

6.1.1.6. Impacts on daily living and movement patterns

Project components and equipment will be transported to site using road transport. The public district road off of the R502 regional road from Klerksdorp provides the primary access to the area. Traffic utilising the road is mainly property owners. Local farmers and residents utilise this road to access their properties.

Increased traffic due to construction vehicles could cause disruptions to road users, the local community and increase safety hazards, especially on the main road that will be utilised – the public

district road off of the R502 regional road from Klerksdorp. The use of local roads and transport systems may cause road deterioration and congestion. An increase of traffic from the rise in construction vehicles is a safety concern for other road users and local communities in the area. Impacts will be magnified since farm roads are not designed to carry heavy traffic and are prone to erosion. Noise, vibrations, dust and visual pollution from heavy vehicle traffic during the construction phase could also negatively impact local residents and road users.

The upgrading of access roads may damage the fences along the access road. Infrastructure such as roads and fencing should be maintained in the present condition and repaired immediately, if damaged as a result of construction activities. The contractor should be responsible for managing this impact on private property.

There are a few residents living in the nearby area, which will be impacted by the project. In terms of regional and local roads involved, the expectation is that the proponent should consult with the relevant roads agency to ensure that they do not contribute to the deterioration of roads without taking some responsibility for repairing the impact that their construction vehicles may have on the road during construction phase.

Mitigation:

- 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.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative impacts:

- Possible increased traffic and traffic disruptions impacting local communities.
- If damage to roads is not repaired, then this will affect other road users and result in higher maintenance costs for vehicles of road users.

Residual impacts:

- Only damage to roads that is not fixed could affect road users.

6.1.1.7. Nuisance impacts (noise and dust)

Impacts associated with construction related activities include noise, dust, and possible disruption to adjacent properties. Site clearing activities increase the risk of dust and noise being generated, which can in turn negatively impact on adjacent properties. The primary sources 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 short in 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. The impact of noise and dust on surrounding land users and local farmsteads can be reduced through the application of appropriate mitigation measures.

Mitigation:

- The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays, and holiday periods where feasible.
- Dust suppression measures must be implemented 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 road worthy, drivers are qualified and are made aware of the potential noise and dust issues.
- A CLO should be appointed, and a grievance mechanism implemented.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative impacts:

- Other construction activities in the area will heighten the nuisance impacts, such as noise, dust and wear and tear on roads.

Residual impacts:

- Construction vehicles and construction could cause additional noise and dust in the area.

6.1.1.8. Increased risk of potential veld fires

During the construction phase there is an increased risk of veld fires due to the presence of construction related activities as well as the presence of construction workers on site. The risk of veld fires poses further threats to the loss of livestock and farmsteads in the area. This could result in the loss or damage of farm infrastructure and threaten human lives. The necessary mitigation measures should be implemented, specifically the site needs to be equipped with the correct firefighting equipment and workers should be trained in firefighting and how to work with the equipment. The area of the site also needs to be fenced off, to keep construction related activities within the vicinity of the site. The area surrounding the site's fences need to be cleared to ensure that veld fires that may occur won't jump to the neighbouring farms. For effective mitigation measures in this regard, see the mitigation measures given below.

Mitigation:

- Contractor to comply with the veld fire management act during construction. 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.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative impacts:

- There are no cumulative impacts because the potential losses can be compensated for.

Residual impacts:

- The residual impacts include the impact on livelihoods and the income generated by the farming activities. The reduced carrying capacity due the loss of grazing fields. In the case thereof compensation need to be paid in the case of any damages and losses.

6.1.1.9. Visual and sense of place impacts

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.

A standalone Visual Impact Assessment has been undertaken as part of the EIA process.

Mitigation:

- 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.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative impacts:

- Other construction activities in the area will heighten the intrusion impacts, such as noise, dust and aesthetic pollution and further negatively impact the area's 'sense of place'.

Residual impacts:

- Additional construction vehicles movement could cause a visual impact due to close proximity to urban area.

Table 6.1: Impact assessment of Kareerand BESS facility Construction Phase

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?	Proposed Mitigation Measures
Direct and indirect employment opportunities and skills development	Before mitigation	Positive	2	4	1	1	1	2	2	22	Low (6-28)	Yes	Yes	• A local employment policy. • Labour should be sourced from the local labour pool. • Training and skills development programmes. • Suppliers should also as far as possible be sourced locally. • Promote gender equality.
	After mitigation	Positive	2	4	1	1	1	3	2	24	Low (6-28)			
Economic Multiplier Effect	Before mitigation	Positive	2	2	1	1	1	2	2	18	Low (6-28)	Yes	Yes	• Local procurement policy. • Historically Disadvantaged Individuals (HDIs) which qualify as potential service providers. • Local procurement is encouraged.
	After mitigation	Positive	3	3	1	1	1	3	3	36	Medium (29-50)			
Potential loss of productive farmland	Before mitigation	Negative	1	3	2	2	1	2	2	22	Low (6-28)	Yes	Yes	• The proposed development needs to be fenced off prior to the construction phase. • Livestock need to be relocated. • Environmental Control Officer (ECO), monitor disturbances. • Implement, manage and monitor a grievance mechanism. • Mitigation measures from the Agricultural and Soil Report.
	After mitigation	Negative	1	2	2	2	1	1	2	18	Low (6-28)			

Influx of jobseekers and change in population	Before mitigation	Negative	2	2	4	3	4	2	2	34	Medium (29-50)	Yes	Yes	• Local procurement policy. • Local community representatives. • Transportation for workers, easy access and no relocation. • Working hours should be kept between daylight hours. • 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. • Appoint a security company and implement appropriate security procedures to ensure that workers do not remain onsite after working hours. • Inform 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.
	After mitigation	Negative	2	2	4	3	3	2	1	16	Low (6-28)			

Safety and security impacts	Before mitigation	Negative	2	3	1	1	1	3	3	33	Medium (29-50)	Yes	Yes	• Working hours should be kept within daylight hours. • Provide transportation for workers to prevent loitering. • The perimeter of the construction site should be appropriately secured. • The appointed EPC Contractor must appoint a security company. • Access in and out of the construction site should be strictly controlled. • A CLO should be appointed as a grievance mechanism. • The EPC Contractor should implement a stakeholder management plan. • Implement a Fire Management Plan. • The EPC Contractor must prepare a Method Statement which deals with fire prevention and management.
	After mitigation	Negative	2	2	1	1	1	2	2	18	Low (6-28)			
Impacts on daily and movement patterns	Before mitigation	Negative	2	3	2	1	1	1	3	30	Medium (29-50)	Yes	Yes	• All vehicles must be road worthy, drivers qualified, obey traffic rules, follow speed limits and be aware of potential road safety issues. • Heavy vehicles should be inspected regularly. • Provision of adequate and strategically placed traffic warning signs.

	After mitigation	Negative	2	2	1	1	1	1	2	16	Low (6-28)			• Enforce compliance to traffic rules. • Avoid heavy vehicle activity during "peak" hours. • The developer and EPC Contractor, fencing along access roads is maintained. • The developer and EPC Contractor, roads utilised are either maintained or upgraded. • The EPC Contractor, damage / wear and tear to the access roads. • Communication must be implemented to lodge complaints from the local community.
Nuisance impacts (noise and dust)	Before mitigation	Negative	2	3	1	1	1	2	3	30	Medium (29-50)	Yes	Yes	• Movement of heavy vehicles, avoid weekends, public holidays, and holiday periods. • Dust suppression measures must be implemented for heavy vehicles. • Vehicles are road worthy; drivers are qualified and aware of the potential noise and dust issues. • A CLO should be appointed, and a grievance mechanism implemented.
	After mitigation	Negative	2	2	1	1	1	2	2	18	Low (6-28)			
Increased risk of potential veld fires	Before mitigation	Negative	2	3	2	3	1	1	3	36	Medium (29-50)	Yes	Yes	• Contractor to comply with the veld fire management act during construction. Adequate fire-fighting equipment should be provided and readily available on site and all staff should be trained in

	After mitigation	Negative	1	3	1	2	1	1	2	18	Low (6-28)			firefighting and how to use the fire-fighting equipment. • No staff (except security) should be accommodated overnight, no open fires on site. • Ensure potential fire risks are done in the designated areas. Precautionary measures, during high wind conditions or winter months. • National Forest and Veld Fires act and the fire management plan.
Visual and sense of place impacts	Before mitigation	Negative	2	3	3	1	1	2	3	24	Low (6-28)	Yes	Yes	• Implement mitigation measures identified in the Visual Impact Assessment (VIA). • Limit noise generating activities to normal daylight working hours and avoid weekends and public holidays. • Movement of heavy vehicles timed to avoid weekends, public holidays, and holiday periods. • Dust suppression measures implemented for heavy vehicles. • All vehicles must be road worthy, drivers qualified, obey traffic rules, follow speed limits. • CLO implement communication, complaints, and grievance channels to the local community.
	After mitigation	Negative	2	3	2	1	1	2	2	20	Low (6-28)			

6.2. Operational Phase

Kareerand BESS facility is anticipated to operate for a minimum of 20 years. The facility will operate continuously, 7 days a week, during daylight hours. While the BESS 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 BESS facility, conducting preventative and corrective maintenance, receiving visitors, and maintaining security. The assessment of associated impacts identified with the operational phase of Kareerand BESS facility is presented in **Table 6.2**.

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

6.2.1. Operational Phase Impacts Associated with Kareerand BESS facility

6.2.1.1. Direct and Indirect employment opportunities and skills development

It is anticipated that the operation of the projects is likely to create a maximum of approximately 10 work opportunities. Maintenance activities will be carried out throughout the lifespan of the project, and will include vegetation control, and general maintenance around the Kareerand BESS facility. The employment opportunities generated as a result of the project will be long term and will last for the duration of operation (i.e., approximately 20 years). 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.

Enhancement:

- 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.

No-Go Alternative:

- 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.

Cumulative impacts:

- Opportunity to reduce unemployment rates.

Residual impacts:

- Improved pool of skills and experience in the local area.

6.2.1.2. Development of non-polluting, renewable energy or alternative energy solution infrastructure

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 GHG emissions. The use of BESS technology for power storage is considered an alternative energy solution, with the capability of reducing energy strain during high demands and storage of excess energy produced by renewable or conventional electricity producers. The alternative energy storage solution is a non-consumptive use of a resource which produces zero GHG emissions during its operation, specifically if renewable sources are used by the storage facility. The storage of 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 and BESIPPP Programmes are regarded as an important contribution, and the advancement of RE has been identified as a priority for South Africa. The BESS facility could reduce the impacts of loadshedding during high demands as they store additional electricity that were not in use.

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

The development of alternative energy solutions 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. It should however be noted that such a benefit is associated with all RE projects and not only BESS power projects.

No-Go Alternative:

- 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.

Cumulative impacts:

- Reduce carbon emissions through the use of renewable energy and contribute to reducing global warming.

Residual impacts:

- Reduce carbon emissions through the use of renewable energy and contribute to reducing global warming.

6.2.1.3. Potential loss of agricultural land

The development of the proposed project on an agricultural property would result in the area of land required to support the development footprint being removed from potential agricultural production. This could have negative implications in terms of food production and security and could also threaten jobs of workers employed in the agricultural activities.

Mitigation:

- The proposed mitigation measures for the construction phase should have been implemented at this stage.
- Mitigation measures from the Agricultural and Soil Report, should also be implemented.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative impacts:

- The cumulative impacts associated with the loss of productive farmland are the effect it has on the livelihoods of the farmers, their families and the workers on the farms and their families. As indicated above this impact can be mitigated through rehabilitation. This also has a cumulative effect on national food security.

Residual impacts:

- The residual impacts for the potential loss of productive farmland are the overall loss of grazing for livestock if the productive farmland is not rehabilitated in the decommissioning phase.

6.2.1.4. Contribution to Local Economic Development (LED) and social upliftment

Projects which form part of the DMREs REIPPP and BESIPPP Programmes 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 need to be invested into 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 the 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.

Enhancement:

- 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).

No-Go Alternative:

- Loss of contribution to LED and social upliftment during the operation of the project.

Cumulative impacts:

- Significant LED and social upliftment of the local communities as a result of other IPP projects within the area.

Residual impacts:

- Social upliftment of the local communities through the development and operation of the project.

6.2.1.5. Impact on tourism

In the North West Province tourism is regarded as an important sector contributing to the provinces' economic sector. The impact however of the proposed Kareerand BESS facility on the tourism sector is likely to be low, but in some cases the Kareerand BESS facility may attract tourists to the proposed area and its surroundings.

Enhancement:

- Due to the extent of the project no viable mitigation measures can be implemented to eliminate the visual impact of the BESS facility, but the subjectivity towards the BESS facility and grid infrastructure can be influenced by creating a "Green Energy" awareness campaign, educating the local community and tourists on the benefits of alternative energy solutions. Tourists visiting the area should be made aware of South Africa's movement towards renewable energy and alternative energy solutions. This might create a positive feeling of a country moving forward in terms of environmental sustainability and consistent electricity supply.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative impacts:

- The cumulative impacts associated with the impact on the tourism sector are not rated significant. Tourism in the Klerksdorp region is not based on scenic attractions, mostly accommodation for current mining operations.

Residual impacts:

- There are no residual impacts identified.

6.2.1.6. Visual and sense of place impacts

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 an alternative energy solution project and could therefore be seen as benefitting the local environment, when compared to non-renewable energy generation projects.

An impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive

light. The social impacts associated with the impact on sense of place relate to the change in the landscape character and visual impact of the Kareerand BESS facility. The area surrounding the project site is characterised by farmland, and electricity infrastructure. Considering this, it can be anticipated that the visual and sense of place impacts associated with the operation of the facility will be of low significance.

Mitigation:

- 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.

No-Go Alternative:

- The current status quo is maintained due to no impact.

Cumulative impacts:

- Potential impact on the current sense of place in the area due to other solar power developments within the area.

Residual impacts:

- The visual impact of the BESS facility will remain if the facility is not decommissioned and dismantled after the end of its operational life.

Table 6.2: Impact assessment of Kareerand BESS facility Operational Phase

Nature of the Impact		Status	Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?	Proposed Mitigation Measures
Direct and Indirect employment opportunities and skills development	Before mitigation	Positive	3	3	3	1	3	2	1	15	Low (6-28)	Yes	Yes	• A local employment policy. • Promote gender equality. • Training programs, the development of skills.
	After mitigation	Positive	3	4	4	1	3	2	1	17	Low (6-28)			
Development of non-polluting, renewable energy infrastructure or alternative energy solutions	Before mitigation	Positive	4	4	1	2	4	3	1	18	Low (6-28)	No	Yes	• None identified
	After mitigation	Positive	4	4	1	2	4	3	1	18	Low (6-28)			
Potential loss of agricultural land	Before mitigation	Negative	1	3	2	2	3	2	2	26	Low (6-28)	Yes	Yes	• Proposed mitigation measures of construction phase should have been implemented at this stage. • Mitigation measures from the Agricultural and Soil Report, should also be implemented.
	After mitigation	Negative	1	2	1	2	3	2	1	11	Low (6-28)			
Contribution to Local Economic Development (LED) and social upliftment	Before mitigation	Positive	4	4	2	1	3	2	3	48	Medium (29-50)	Yes	Yes	• A CNA must ensure that LED and social upliftment programmes are meaningful. • Communication and reporting are required to ensure that maximum

	After mitigation	Positive	4	4	3	1	3	3	4	72	High (51-73)			benefit is obtained from the programmes, • Review programmes on an ongoing basis to ensure that they are best suited to the needs of the community at the time.
Impact on tourism	Before mitigation	Positive / Negative	2	3	1	1	3	2	2	24	Low (6-28)	Yes	Yes	• Due to the extent of the project no viable mitigation measures can be implemented to eliminate the visual impact of the BESS, but the subjectivity towards the BESS can be influenced by creating a "Green Energy" awareness campaign, educating the local community and tourists on the benefits of renewable energy. Tourists visiting the area should be made aware of South Africa's movement towards renewable energy. This might create a positive feeling of a country moving forward in terms of environmental sustainability.
	After mitigation	Positive / Negative	2	3	1	1	3	2	2	24	Low (6-28)			
Visual and sense of place impacts	Before mitigation	Negative	2	3	1	3	3	2	2	28	Low (6-28)	Yes	Yes	• 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.
	After mitigation	Negative	2	3	1	2	3	2	1	13	Low (6-28)			

6.3. 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, 11 other alternative applications have been submitted to the Department within the geographic area of investigation (refer to **Table 6.3** and **Figure 6.1** for an overview of renewable facilities within a 30km radius of the project site).

Table 6.3: 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	Proposed generating capacity	DFFE reference	EIA process	Project status
Projects included in the REEA database (May 2023)					
The proposed 100MW Buffels solar energy facility and its associated infrastructure near Orkney, North West Province.	0 km	100	14/12/16/3/3/2/777/AM2	Amendment	Approved
The proposed Construction of the 100MW Buffels Solar 2 Solar Energy Facilities on Portion 5 and 57 within the City of Matlosana Local Municipality.	430m	100	14/12/16/3/3/2/778	Scoping & EIA	Approved

The establishment of 100MW Nyarhi solar power plant and its associated infrastructure near Viljoenskroon, Free State Province.	4.1 km	100	14/12/16/3/3/1/2533	BAR	Approved
Proposed construction of the 61MW Witkop Solar PV II facility on a site near Orkney, North West Province	4.2 km	61	12/12/20/2507/2	Amendment	In Process
The proposed vaal river solar 3 PV facility, North West Province.	5.8 km	250	12/12/20/2513/3/AM6	Amendment	Approved
The proposed 150MW Siyanda photovoltaic solar facility and associated infrastructure on the remaining extent of portion 1 of the farm Grootdraai 468, registration division Viljoenskroon situated within Moqhaka local municipality and the Greater Fezile FS.	8.8 km	150	14/12/16/3/3/2/1/2369	BAR	Approved
he 150MW Paleso solar power plant near Viljoenskroon situated within the Moqhaka local municipality, the Greater Fezile Dabi District Municipality in the Free State Province	11.5 km	150	14/12/16/3/3/1/2365	BAR	Approved
The proposed Noko solar plant near Orkney, North West Province.	19 km	150	14/12/16/3/3/1/2474	BAR	Approved
The proposed 50MW Doornhoek 2 PV facility on portion 18 of the farm Doornhoek 372 IP within the Dr Kenneth Kaunda District Municipality in the North West Province.	22 km	50	14/12/16/3/3/1/2549	BAR	Approved
The 100MW Orkney PV solar energy facility & the 92 meter 132kv powerline on the rem/ext of ptn 7 & the rem/ext of ptn 21 0f the farm Wolvehuis.	24	100	14/12/16/3/3/2/954/AM1	Amendment	Approved

The Proposed Construction Of A Grid Connected 20mwp Photovoltaic Power Plant And Its Associated Infrastructure On A Portion Of Portion 434 Of The Farm Town And Townlands 435 Iq, Potchefstroom, North West Province.	27.8 km	20	12/12/20/2629/AM1	Amendment	Approved

*** It is unclear whether other projects not related to alternative energy will be constructed in this area. In general, development activity in the area is focused on agriculture and mining. It is quite possible that more future alternative energy developments 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 jobseekers and change in the area's sense of place.

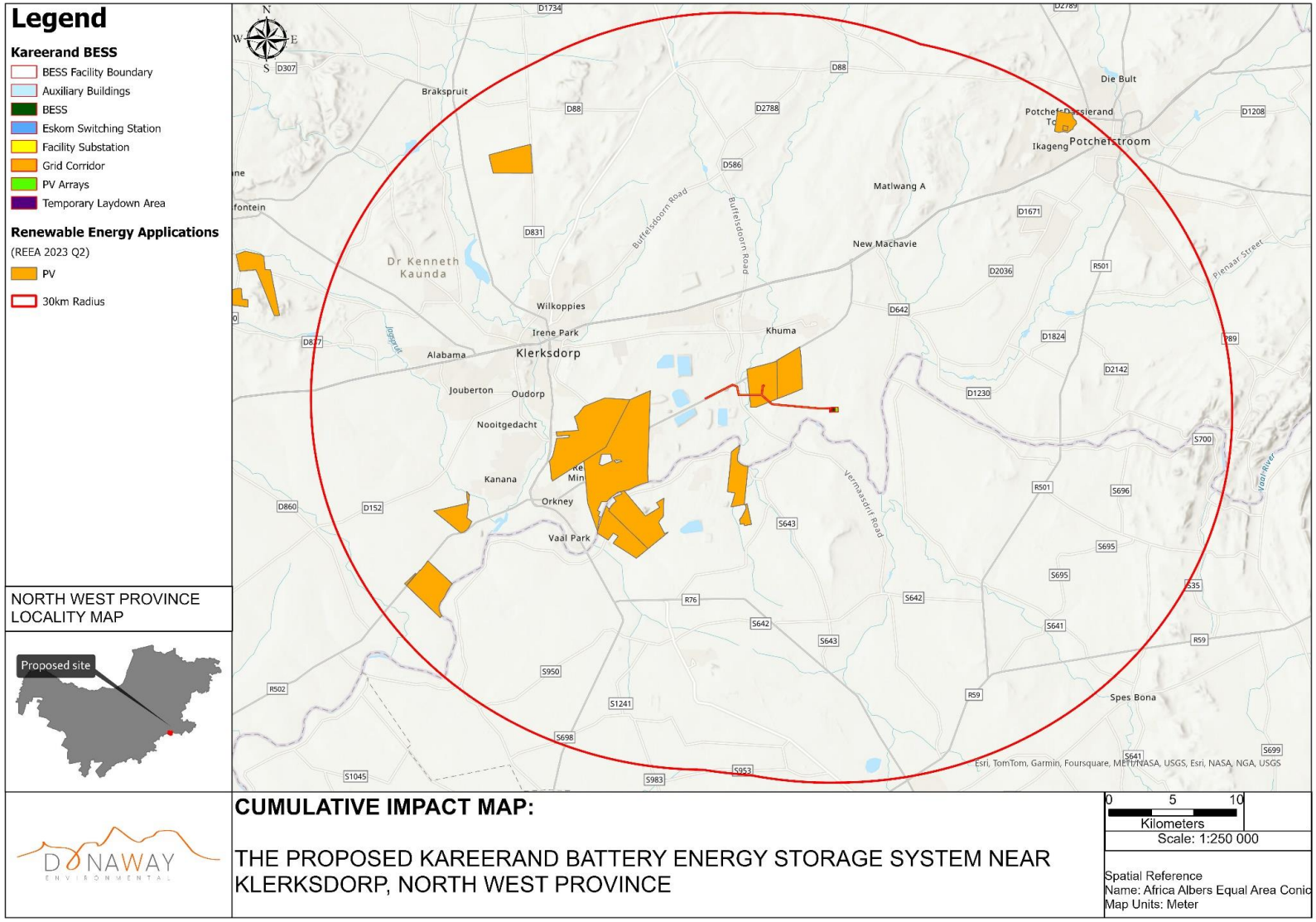

Figure 6.1: Kareerand BESS facility Geographic area of evaluation with utility-scale renewable energy generation sites

The geographic spread of renewable energy 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 30km 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 assessment of the Kareerand BESS facility is presented in **Table 6.4**.

6.3.1. Cumulative Impacts Associated with the Kareerand BESS facility

6.3.1.1. Cumulative impact from employment, skills and business opportunities

Kareerand BESS facility and the establishment of other renewable or alternative storage solution projects within the area has the potential to result in significant positive cumulative impacts, specifically with regards 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 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 that of Kareerand BESS facility alone.

Enhancement:

- The establishment of several renewable energy or alternative storage solution projects under the BESIPPP and REIPPP Programmes in the area has the potential to have a positive cumulative impact on the area in the form of employment opportunities, skills development and business opportunities. The positive benefits will be enhanced if local employment policies are adopted, and local services providers are utilised by the developers to maximise the project opportunities available to the local community.

Residual impacts:

- Improved pool of skills and experience in the local area.
- Economic growth for small-scale entrepreneurs.

6.3.1.2. Cumulative impact with large scale in-migration of people

While the development of a 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 suitable for the development of commercial renewable energy facilities implies that the surrounding area is likely to be subject to considerable future applications for energy generation or storage 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 with a local employment policy in order to reduce the potential of such an impact occurring.

Mitigation:

- Develop a recruitment policy / process (to be implemented by contractors), which will source labour locally.
- Work together with government agencies to ensure service provision is in line with the development needs of the local area.
- Form joint ventures with community organisations, through Trusts, which can provide local communities with benefits, such as employment opportunities and services.

Residual impacts:

- Possibility of outside workers remaining in the area after construction is completed and subsequent pressures on local infrastructure, services and poverty problems.

Table 6.4: Cumulative impact assessment of Kareerand BESS facility

Nature of the Impact		Status	Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?	Proposed Mitigation Measures
Cumulative impact from employment, skills and business opportunities	Impact in isolation	Positive	3	3	1	1	3	2	1	13	Low (6-28)	Yes	Yes	• The establishment of several solar power projects under the BESIPP and REIPPP Programmes in the area has the potential to have a positive cumulative impact on the area in the form of employment opportunities, skills development and business opportunities. The positive benefits will be enhanced if local employment policies are adopted, and local services providers are utilised by the developers to maximise the project opportunities available to the local community.
	Cumulative impact	Positive	3	4	1	1	3	2	3	42	Medium (29-50)			
Cumulative impact with large scale in-migration of people	Impact in isolation	Negative	2	2	1	1	2	2	2	20	Low (6-28)	Yes	Yes	• Develop a recruitment policy / process (to be implemented by contractors), which will source labour locally. • Work together with government agencies to ensure service provision is in line with the development needs of the local area. • Form joint ventures with community organisations, through Trusts, which can provide local communities with benefits, such as employment opportunities and services.
	Cumulative impact	Negative	2	3	1	1	3	3	3	39	Medium (29-50)			

6.4. 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 who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of Kareerand BESS facility it is anticipated that the proposed facility will be refurbished and upgraded to prolong its life. No decommissioning of the facility is proposed.

6.5. Assessment of Alternative Sites

No alternative sites have been identified for assessment. 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 EIA process.

6.6. Assessment of Impacts for the No-Go Alternative

The “no-go” alternative is the option of not constructing Kareerand BESS facility. The implementation of Kareerand BESS 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 phase of the project.

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

- Potential influx of job seekers and an associated change in population and increase in pressure on basic services.
- Potential safety and security impacts.
- Potential impacts on daily living and movement patterns.
- Potential nuisance impacts (noise and dust).
- Potential visual 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 Kareerand BESS facility would not compromise the development of RE or alternative storage solution facilities in South Africa. However, the socio-economic benefits for local communities associated with this specific project would be forfeited.

The use of renewable energy and alternative energy storage solutions will increase. By reducing the use of coal, carbon emissions will reduce and effectively benefit climate change and global warming.

7. KEY FINDINGS AND RECOMMENDATIONS

This SIA focused on the collection of data to identify and assess social issues and potential social impacts associated with the development of Kareerand BESS facility. Secondary data was collected and presented in a literature review and primary data was collected through consultations with affected and adjacent landowners and key stakeholders. The environmental assessment framework for assessment of impacts and the relevant criteria were applied to evaluate the significance of the potential impacts. A summary of the potential positive and negative impacts identified for the detailed design and construction, and operation phase are presented in

Table 7.1 and **Table 7.2**. A summary of the potential positive and negative cumulative social impacts identified for the project is provided in **Table 7.3**.

Table 7.1: Summary of potential social impacts identified for the detailed design and construction phase

Impact	Significance Without Mitigation / Enhancement	Significance With Mitigation / Enhancement
Positive Impact		
Creation of direct and indirect employment and skills development opportunities.	Positive Low (22)	Positive Low (24)
Economic multiplier effects	Positive Low (18)	Positive Medium (36)
Negative Impacts		
Potential loss of productive farmland	Negative Low (22)	Negative Low (18)
In-migration of people (non-local workforce and jobseekers).	Negative Medium (36)	Negative Low (16)
Safety and security impacts	Negative Medium (33)	Negative Low (18)
Impacts on daily living and movement patterns	Negative Medium (30)	Negative Low (16)
Nuisance impact (noise and dust)	Negative Medium (30)	Negative Low (18)
Potential impacts of increased risk of potential veld fires	Negative Medium (36)	Negative Low (18)
Visual and sense of place impacts	Negative Low (24)	Negative Low (22)

Table 7.2: Summary of potential social impacts identified for the operation phase

Impact	Significance Without Mitigation / Enhancement	Significance With Mitigation / Enhancement
Positive Impact		
Direct and indirect employment and skills development opportunities	Positive Low (15)	Positive Low (17)
Development of non-polluting, renewable energy infrastructure	Positive Low (18)	Positive Low (18)
Contribution to LED and social upliftment	Positive Medium (48)	Positive High (72)
Potential impacts on tourism	Positive Low (24)	Positive Low (24)
Negative Impacts		
Potential impacts on tourism	Negative Low (24)	Negative Low (24)
Impacts associated with the loss of agricultural land.	Negative Low (26)	Negative Low (11)
Visual and sense of place impacts	Negative Low (28)	Negative Low (13)

Table 7.3: Summary of potential cumulative social impacts identified for the project

Cumulative Impact	Significance Without Mitigation / Enhancement	Significance With Mitigation / Enhancement
Positive Cumulative Impact		
Cumulative impact from employment, skills and business opportunities and skills development	Positive Low (13)	Positive Medium (42)
Negative Cumulative Impacts		
Cumulative impact with large-scale in-migration of people	Negative Low (20)	Negative Medium (39)

7.1. Key Findings

The Klerksdorp and surrounding communities are some vulnerable communities within the project area that may be affected by the development of the Kareerand BESS facility and its associated infrastructure. Traditionally, the construction phase of an alternative energy storage solution facility is associated with most social impacts. Many of the social impacts are unavoidable and will take place to some extent but can be managed through the careful planning and implementation of appropriate mitigation measures. Several potential positive and negative social impacts have been identified for

the project, however an assessment of the potential social impacts indicated that there are no perceived negative impacts that are so significant to allow them to be classified as “fatal flaws”.

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

- The construction phase of the Kareerand BESS 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 BESS projects but rather common in most construction projects. These impacts can be reduced by implementing proposed mitigation measures. Therefore, taking proactive measures to minimize the significance of these impacts on Klerksdorp and the surrounding communities.
- The development of the Kareerand BESS facility will generate employment opportunities for individuals from the Klerksdorp and surrounding communities. During the construction phase, approximately 100 job opportunities will be created, providing a temporary source of employment. Specifically, this would benefit the JB Marks LM and City of Matlosana LM as a large proportion of the population is not economically active (40.4% for JB Marks LM and 35.7% for the City of Matlosana LM) or is unemployed (12.7% and 19.6%). Following the construction phase, a limited number of job opportunities will be available during the operational phase. By reducing the region’s dependency and boosting overall quality of life, the Kareerand BESS facility will contribute significantly to the community’s economic growth. Additionally, this would create jobs outside the current main job creator in the region.
- The implementation of the Kareerand BESS facility is expected to enhance the 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. Consequently, the overall educational level of the people residing in the JB Marks LM and City of Matlosana LM is expected to improve.
- The JB Marks and City of Matlosana LM's economy has the potential to benefit from the proposed project by fostering entrepreneurial growth and opportunities, particularly for local businesses in Klerksdorp and surrounding town. The JB Marks LM is included although the closet town, Klerksdorp, is not situated within the local municipality. 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 alternative energy storage solution facilities to the currently proposed facilities could amplify these benefits.
- The proposed development of the Kareerand BESS facility represents an investment in alternative energy storage solutions. In the possibility of electricity supplied from renewable energy sources presents a favourable social benefit for society.
- It should be noted that the perceived benefits associated with the Kareerand BESS facility, which include electricity storage to reduce supply strain and local economic and social development, outweigh the perceived negative impacts associated with the project.
- The proposed development of the Kareerand BESS facility could reduce current loadshedding associated with the country, specifically reducing the current strain on Eskom power generation facilities. Not only can it supply electricity when demand is high but store the surplus electricity from either traditional Eskom sources or other renewable sources. Which

in return could reduce strain imposed on companies as a result of loadshedding. In return this could lead current and future work opportunities to be of a more stable nature and not impose additional strain on companies.

7.2. 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 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 in order to enhance the multiplier effect.
- Involve the community in the process as far as possible (encourage co-operative decision making and partnerships with local entrepreneurs).
- Employ mitigation measures to minimise the dust and noise pollution and damage to existing roads.
- Safety and security risks should be considered during the planning / construction phase of the proposed project. Access control, security and management should be implemented to limit the risk of crime increasing in the area.

7.3. Conclusion

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

The proposed Kareerand BESS facility has the potential to generate additional income and employment opportunities for Klerksdorp and the surrounding communities. This benefit could be particularly significant to reduce the dependency of job opportunities in the mining sector, with the majority of the economic development and working opportunities associated with the mining activities. As a whole, unemployment in South Africa is significantly high and additional job opportunities would not only benefit the region but the overall South African employment ratio. Positive impacts can be associated with the Kareerand BESS facility with regard to a reduction in electricity supply strain, as the facility could supply required power to the grid during higher demand stages where supply could not achieve the set out requirement. In return, this could lead to a reduction in load shedding and the strain on Eskom power and renewable utilities.

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