

APPENDIX E8: Socio-Economic Impact Assessment

GENESIS ECO ENERGY (PTY) LTD

PROPOSED PARYS 200MW SOLAR PHOTOVOLTAIC PROJECT SOUTH
OF PARYS, FREE STATE PROVINCE

SOCIO-ECONOMIC IMPACT ASSESSMENT REPORT

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LIST OF ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome
BESS	Battery Energy Storage System
CRR	Comments and Response Report
DEA	Department of Environmental Affairs
DFA	Development Facilitation Act (Act 67 of 1995)
DMRE	Department of Mineral Resources and Energy
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GIS	Geographic Information System
HIV	Human Immunodeficiency Virus
IAP	Interested and Affected Party
ILO	International Labour Organisation
IRP	Integrated Resource Plan
ISO	International Organisation for Standardization
km	Kilometre (1 000m)
NDP	National Development Plan
NEMA	National Environmental Management Act (No. 107 of 1998)
MMM	Mangaung Metropolitan Municipality
MW	Mega Watt (one million watts)
OHS	Occupational Health and Safety
PAJA	Promotion of Administrative Justice Act ((PAJA) Act 3 of 2000)
PV	Photovoltaic
SIA	Social Impact Assessment
STI/STD	Sexually Transmitted Infections / Sexually Transmitted Disease

1 INTRODUCTION

The team of Caroline Tanhuke, Ntando Myeni and Ciaran Chidley of Nemaï Consulting have been appointed to undertake the Social Impact Assessment (SIA) as part of the environmental authorisation process for the proposed Parys 200MW Solar Photovoltaic Project .

This solar PV generator aims to provide 200MW of electricity to the electrical grid. The project is being prepared for submission to bid for the current and future Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) bid windows and/or other renewable energy markets within SA.

The proposed project is located to the south of the city of Parys in the northern Free State Province.

One of the specialist studies required by the Environmental Impact Assessment (EIA) is a Social Impact Assessment. This report fulfils the requirements of the Social Impact Assessment and its recommendations will be included into the EIA.

1.1 Terms of Reference

The terms of reference for the study are as follows:

- Describe the Social baseline conditions that may be affected by the project;
- Describe the approach proposed for assessing the potentially significant issues that should be addressed by the SIA during the EIA phase;
- Determine the specific local social impacts of the project;
- Identify the potential social issues associated with the project;
- Suggest suitable mitigation measures to address the identified impacts; and
- Make recommendations on preferred options from a social perspective.

1.2 Structure of the report

The remainder of the report is structured as follows:

Section 2: Legislation – A description of the statutory and regulatory requirements that informed this report.

Section 3: Project Description – This section provides an introduction and motivation to the project. It includes a description of the study area.

Section 4: Methodology – Outline the methodology used to determine the social impacts of the proposed project.

Section 5: Situational Analysis – A desktop analysis of the baseline situation in the study area. The section includes a discussion on the findings that resulted from community engagement, site visits and stakeholder participation.

Section 6: Identification of Impacts - Aspects and Impacts – The identification of the project activities and an investigation into what aspects of these activities will result in social impacts.

Section 7: Analysis of Alternatives – Decision making with regards the preferred project alternatives from a social perspective.

1.2 Specialists' Details

This report is written by Caroline Tanhuke and Ciaran Chidley. Ciaran Chidley obtained bachelor's degrees in civil engineering, economics and philosophy, and holds a Master of Business Administration. His experience over the past 26 years includes economic and social assessments for a wide variety of linear and site-based infrastructure and industrial projects. Caroline Tanhuke holds a B.A Environmental Management (Geography) Degree and has three years of experience. Her experience in assessing social impacts of infrastructure projects include powerlines and pipelines. She has conducted social facilitation projects throughout South Africa. Ntando Myeni holds a Bachelor Social of Science with majors in Geography and Environmental Management and has five years of experience. Her experience in conducting stakeholder engagement and assessing social impacts include mining and water infrastructure projects.

1.3 Specialist Declaration

Nemai Consulting operates as an independent consultant conducting environmental impact assessments and associated specialists' studies. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget).

2 PROJECT DESCRIPTION

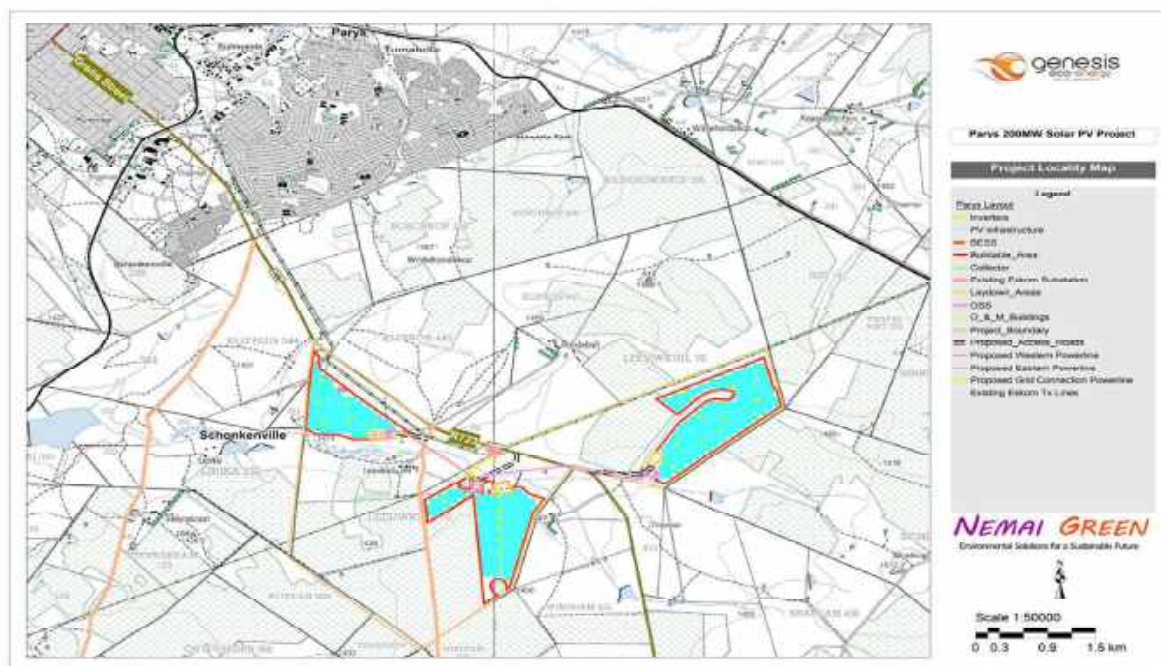
The South African Government ratified the Paris Agreement in 2016, and thereby showed the country's commitment to contribute to the global effort to address the challenge of climate change. In so doing, electricity generation sources need to be diversified to ensure security of supply and reduction in the carbon footprint created by the current heavy reliance of South Africa on coal to produce electricity.

Electricity demand is increasing in SA, and supply from the traditional supplier, Eskom is shrinking, and to match that demand there is a need to supply a diversified power generation that includes renewable energy technologies. These technologies include solar, wind, small utility scale hydro, biomass, biogas and energy storage that the Department of Mineral Resources and Energy intends to develop and implement as identified in the approved Integrated Resource Plan 2019.

2.1 Project Locality

The Project is located in the northern part of the Free State Province and falls within the Fezile Dabi District Municipality and the Ngwathe Local Municipality. The site is located approximately three and a half kilometres to the south-east of the town of Parys and is divided by the R723 provincial road. The project locality is displayed in Figure 1 below.

Figure 1: Project Locality



The Project is located on the properties detailed in **Error! Reference source not found.** below. The tie-in to the existing substation will be routed through the adjacent property.

Table 1: Property Details

Farm Details	21-digit Surveyor General No.
PV Site	
RE of the Farm Leeuwkuil 76	F02500000000007600000
Power Line Route Tie-in to Existing Eskom Substation	
Portion 4 of the Farm Leeuwkuil 76	F02500000000007600004
Power Line Routes	
RE of the Farm Leeuwkuil 76	F02500000000007600000

The overall size of the Remainder of Farm Leeuwkruil 76 is approximately 1 234 ha, of which the combined buildable area is split over 3 areas and is approximately 335 ha. This figure excludes linear components such as powerlines and access roads. The overall length of the proposed 132 kV power lines between the on-site substation and the grid connection point at Eskom's existing Parys Rural 132/11 kV Substation is approximately six hundred metres.

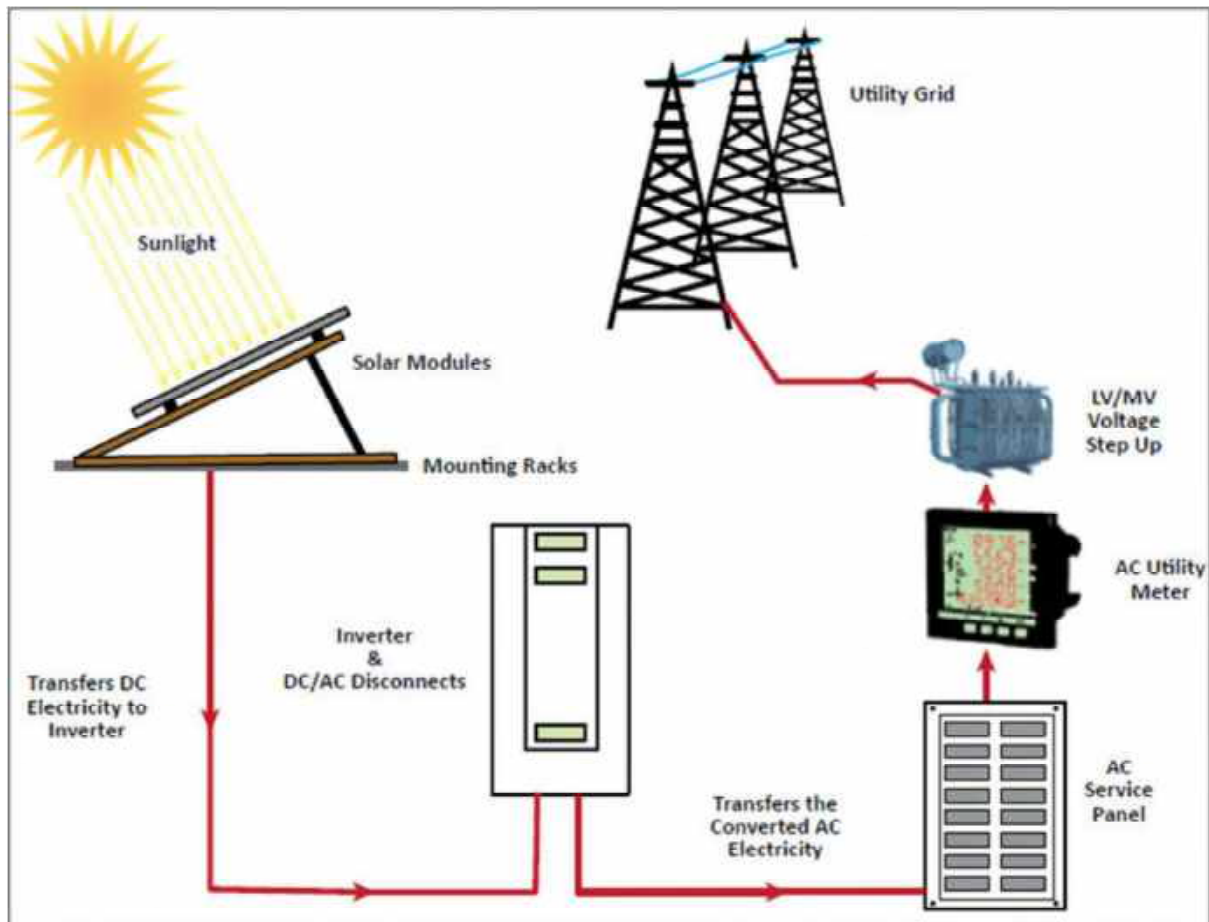
2.2 Project Components

Genesis Eco Energy (Pty) Ltd has proposed the development of the project to feed up to 200MW of solar photovoltaic power alongside a Battery Energy Storage System. The power will be fed into the existing 132 KV distribution network of Eskom. To this end, Genesis Eco Energy intends to bid for current and future Renewable Energy Independent Power Producer Procurement Programme bid windows and/or other renewable energy markets within South Africa, in compliance with the National Energy Act was promulgated in 2008 (Act 34 of 2008).

The solar energy functions by the conversion of solar energy into electricity. The generation of electricity using solar energy is a non-consumptive use of a natural resource that requires no fuel for continued operation.

Solar energy creates a negligible amount of greenhouse gases during its existence. Solar energy facilities emit no carbon dioxide, sulphur dioxide or any other air pollution.

Photovoltaic technology generates direct current, which is subsequently converted to alternating current by electronic power inverters. The below figure provides an overview of a solar power generation system.



Energy is harvested from the solar modules, which are angled to sun using mounting racks. The energy harvested is in the form of direct electrical current, which is processed through the inverters to convert this electrical power into alternating electrical current which can be used by the national electrical system. The alternating current is transferred out of the project site and onto the national grid through transmission line and a connected to a local sub-station. From there on, the electricity is used by consumers through a system of electrical meters and transformers to bring power to the loads.

The photovoltaic panels will be approximately two in height with a preferred option of a single axis tracking system. One axis will contain a single-axis tracking system tilt, which will be used to track the sun's rotational movement from East to West during the day. The trackers are mounted on steel posts that are installed in the ground; and at times concrete bases are also used. There will be a removal of trees on the project site to prevent the shading of the photovoltaic modules; however, the ground between the trackers will be left covered in grass. Internal roads on the photovoltaic sites will have a twelve-metre reserve with a four metre road width. Access roads from the photovoltaic sites to existing roads will have a fourteen-metre reserve and an eight-metre road width. Perimeter fencing details remain to be finalised; but will be approximately three metre in height with the provision of remote security monitoring.

The maximum capacity of the Battery Energy Storage System will be 45MW and the technology will be the commercially proven solid state battery systems comprising of the Lithium-Ion technology. The Battery Energy Storage System will comprise a maximum of forty-five shipping containers, each with

a battery storage capacity of 1 MW. The approximate dimensions of the containers will be 20m long; 3m wide; and 3m high.

The technology contains lithium that is considered as hazardous/dangerous; therefore, suppliers will be responsible for removing and recycling used batteries off-site. In addition, batteries which contain chemicals that, when charged, are a fire risk and will need to be recycled once they reach their end of life.

The electricity generated by the proposed solar photovoltaic facility will be transferred to the national grid. There is one power line route that is still under consideration; and it connects to the existing Eskom Parys 132/22 kV Substation located to the north of the site through a six hundred metre single circuit twin conductor 132 kV line. The voltage of the electricity generated by the project will be transformed on site via a step-up transformer in the on-site substation that will be constructed by the applicant. The Project's proposed overhead power line will be aligned alongside property boundaries and existing power lines as far as possible.

2.3 Social Stimulus

Solar PV creates several social impacts which are created at different stage of the value chain. The value chain can be conceptualised as being during the following events (IRENA and CEM, 2014):

- Project planning – consulting work conducted by specialists;
- Manufacturing – raw material sourcing and component manufacture and assembly. Component manufacturing covers the solar modules, transformers, inverters, electrical cabling, combiner boxes and module support structures;
- Installation – a labour intensive process involving civil engineering contractors, module installation and electrical engineering contractors;
- Grid Connection – carried out by specialised electrical engineering contractors. This work allows the solar park to contribute to the national grid, thereby contributing to stabilising supply of electricity;
- Operations and Maintenance – a long-term activity requiring regular plant monitoring, equipment inspections and repair services; and
- De-commissioning – plant at the end of their lifespan require activities such as recycling the modules and disposal or reselling of components.

The potential for creating value within the regional study area and into the broader Free State economy is depends on the level of development of the renewable energy sector. The major cost items for a solar park are the modules, the transformers, and the inverters – these will be imported items. The cabling and electrical systems can be manufactured in South Africa. The economic value created through installation and grid connection can be created within South Africa, with much of the labour and semi-skilled workers being available within the regional study area.

As South Africa's level of development in the renewable energy field increases, so the value captured within the country will increase all along the value chain.

2.3.1 Job Creation

The number of jobs created for the construction phase was estimated in 2007 as being 69.1 per MW installed, and 0.73 / MW installed during the operations and maintenance phase (IRENA and CEM, 2014). The definition of “jobs” in this case would be work opportunities of any duration above one month. For the proposed project, this yields total values of 13 820 during construction, and 146 during operations and maintenance. These jobs are not all created on the construction site, they are distributed throughout the value chains of these two phases, at different parts of the country where the value is being created. This estimate does not include the jobs created by the BESS segment of the project, which adds to the numbers estimated above.

The Independent Power Producers programme, managed by the Department of Energy has local content requirements and targets for the bid windows. Some of these targets are:

- Job creation for SA citizens – a minimum of 50% and a target of 80%; and
- Local content for SA manufactures – a minimum of 45% and a target of 65%, the minimum has been increased by 10% from bid window 2.

The proportion of employment from local communities for all renewable energy projects have been reported (Department of Energy, 2019). The Department of Energy reports that of the 33 019 job years created for the entire renewable energy procurement programme, 18 253 job years were attributable to people from the local community – this is a proportion of 55%. This proportion can be attributed to the proposed project. The Department of Energy also cites figures that 8% of employment was female and 41% was from the youth category (Department of Energy, 2019). These proportions can also be attributable to the project.

An estimate of the number of job years to be created by the proposed project can be derived from the Department of Energy Report using the figures to date for the Limpopo Province. A provincial breakdown is provided for 3 projects (all completed) which all use Solar PV technology. It was reported that 118MW of energy was generated, creating 1 240 job years to date (which included all the construction jobs) and estimated at 2 917 job years over the 20-year life of the projects (Department of Energy, 2019). Applying these proportions to the proposed project yields the total job years of 4 944 and a construction phase job phase year estimate of 2 102. These figures do not include the contribution from the BESS segment of the project, which has not been studied in the literature.

The table below summarises the job creation estimates for the proposed project. Readers should bear in mind the various sources for this information, the assumptions made and the dates of the data – together these factors combine to set the degree of accuracy for these estimates at 20%.

Table 2: Job Creation Estimate Summary

Description	Total No.	Local No.
Total Job Years Created (Direct)	4 944	2 472
Planning and Construction Phase	2 102	1 051
Operation and Maintenance Phase, 20 years	2 842	1 421

2.3.2 Economic Value Creation

The contribution of the project to South Africa's Gross Domestic Product (GDP) can be estimated from published literature. A Department of Energy report using the figures for renewable project delivery to date for the Limpopo Province provides an indication. A provincial breakdown is provided for 3 projects (all completed) which all use Solar PV technology. It was reported that 118MW of energy was generated, creating R3.6 billion in GDP contribution (Department of Energy, 2019). Applying this proportion to the proposed project yields a total GDP contribution of R6.1 billion. This captured the total impact of the project on the nation's economy, both through direct and indirect spending.

The local content for Solar PV projects has varied over the four bid windows. Bid window 1 achieved 50% local content, bid window 2 achieved 52%, bid window 3 achieved 55% and bid window 4 achieved 75% (Department of Energy, 2019). This increasing trend demonstrates the possible impact that the proposed project could have on the South African value chain. To date, the average local content spend for PV projects in South Africa has been R46.5 billion versus a comparable total project value of R90.3 billion – a percentage of 51%.

If this value is applied to the proposed project value of R2 billion, a local value chain addition of R1 billion can be estimated.

3 RELEVANT LEGISLATION, STANDARDS AND GUIDELINES

Legislation, policy, plans and strategy provide an important framework and governance of the SIA. This section provides a summary of the prevailing acts, policies, plans and strategy which were considered by this study.

3.1 The Constitution of South Africa (Act 7 of 1996)

The Constitution emphasizes human rights with the intention of establishing a society based on democratic values; social justice and fundamental human rights. Furthermore, The Constitution recognizes the general need to improve the quality of life of all citizens. These constitutional rights can be used to support reasonable environmental demands. Other fundamental rights in the Constitution which support environmental demands include:

- The right to life (Section 11).
- The right to human dignity (Section 10).
- The right to privacy (Section 14).
- Certain socio-economic rights.

Socio-economic rights relevant to environmental rights:

- The right of access to adequate housing (Section 26).
- The right of access to sufficient food and water (Section 27).

- The right of access to health care services (Section 27).
- The rights of children to basic nutrition and shelter, and to be protected from maltreatment; neglect; abuse or degradation (Section 28).

3.2 National Development Plan (2011)

The National Development Plan (NDP) of 2010 proposes to “invigorate and expand economic opportunity through infrastructure, more innovation, private investment and entrepreneurialism.

The Plan aims to ensure that all South Africans attain a decent standard of living through the elimination of poverty and reduction of inequality. The core elements of a decent standard of living identified in the Plan are:

- Housing, water, electricity and sanitation;
- Safe and reliable public transport;
- Quality education and skills development;
- Safety and security;
- Quality health care;
- Social protection;
- Employment;
- Recreation and leisure;
- Clean environment; and
- Adequate nutrition.

3.3 National Energy Act (Act 34 of 2008)

The National Energy Act was promulgated in 2008 (Act 34 of 2008); and one of the key objectives of the Act was to promote diversity in the supply of energy and its sources. The development of a National Integrated Energy Plan (IEP) was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and; in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and; on an annual basis; review and publish the IEP in the Government Gazette. 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 IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply constriction and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process; eight key objectives were identified; namely:

- Objective 1: Ensure security of supply.
- Objective 2: Minimize the cost of energy;
- Objective 3: Promote the creation of jobs and localization.

- Objective 4: Minimize 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; and
- Objective 8: Increase access to modern energy.

3.4 National Environmental Management Act (Act 107 of 1998)

The National Environmental Management Act (NEMA) and the principles contained therein have a significant influence on the need to identify and assess social impacts. The NEMA principles are based on the basic rights as set out in Chapter 2 (Bill of Rights) of the Constitution as referred to above.

According to Barber (2007:16) the following NEMA principles have an important impact on social issues:

- 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;
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must consider the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option;
- Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons;
- Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination;
- The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured;
- Decisions must consider the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge;
- Community well-being and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means;
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in light of such consideration and assessment;

- The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected;
- Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law;
- The environment is held in public trust for the people. The beneficial use of environmental resources must serve the public interest and the environment must be protected as the peoples' common heritage; and
- The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.

3.5 Guideline for Involving Social Assessment Specialists in EIA Processes (Barbour, 2007)

These guidelines direct the role of social assessment specialists in the Environmental Impact Assessment (EIA) process within the South African context.

3.6 Social Impact Assessment: Guidance document (2015) (Vanclay, Esteves, Aucamp, & Franks, 2015)

This document encapsulates the core values of the international SIA community providing a set of principles to guide SIA practitioners in incorporating the social element into environmental impact assessments.

3.7 International Labour Organisation

A guide on gender issues in employment and labour market policies: working towards women's economic empowerment and gender equality

"The objective of this resource guide is to strengthen the capacities of International Labour Organisation (ILO) constituents and development policy makers in the formulation of employment policies. There is a well-known proclivity among many policy-makers and practitioners to treat employment as a "residual" of economic growth" (Otope, 2014).

3.8 International Organisation for Standardization, ISO 14001:2004

The International Organisation for Standardization (ISO) is used for identifying impacts. The ISO 14001: 2004 – Environmental Management Systems definitions for aspect, activity and impact are used in keeping with best practice.

ISO 14001:2004 specifies requirements for an environmental management system to enable an organization to develop and implement a policy and objectives and information about significant environmental aspects. It applies to those environmental aspects that the organization identifies as those which it can control and those which it can influence.

4 DEFINITION OF THE STUDY AREA

A study area is defined by the International Finance Corporation (IFC) as "an area that is likely to experience impacts from, or exert influence over, the Project or activity being evaluated" (IFC World Bank, 2012). For the purposes of this study, a study area that conforms to existing administrative boundaries, has been identified. The area anticipated to be affected by the Project is identified below.

Three study areas have been delineated for the purposes of analysing the project and its social impacts: a regional study area which comprises the affected local municipality; and a local study area which is the Ward in which the project is located, and a direct study area which is the site's close neighbours upon which the project will be located. For the purposes of the study, a buffer of two hundred metres from the perimeter of the site has been selected as the direct study area.

4.1 Regional Study Area

The regional study area is Ngwathe Local Municipality (NLM) within the Free State Province is the regional study area most likely to have direct positive or negative impacts. These impacts include economic pull (job creation), in-migration of workers and multiplier effects in the local and regional economy due to the proximity of the Project footprint. Figure 2 below shows the regional study area

Figure 2: Regional Study Area

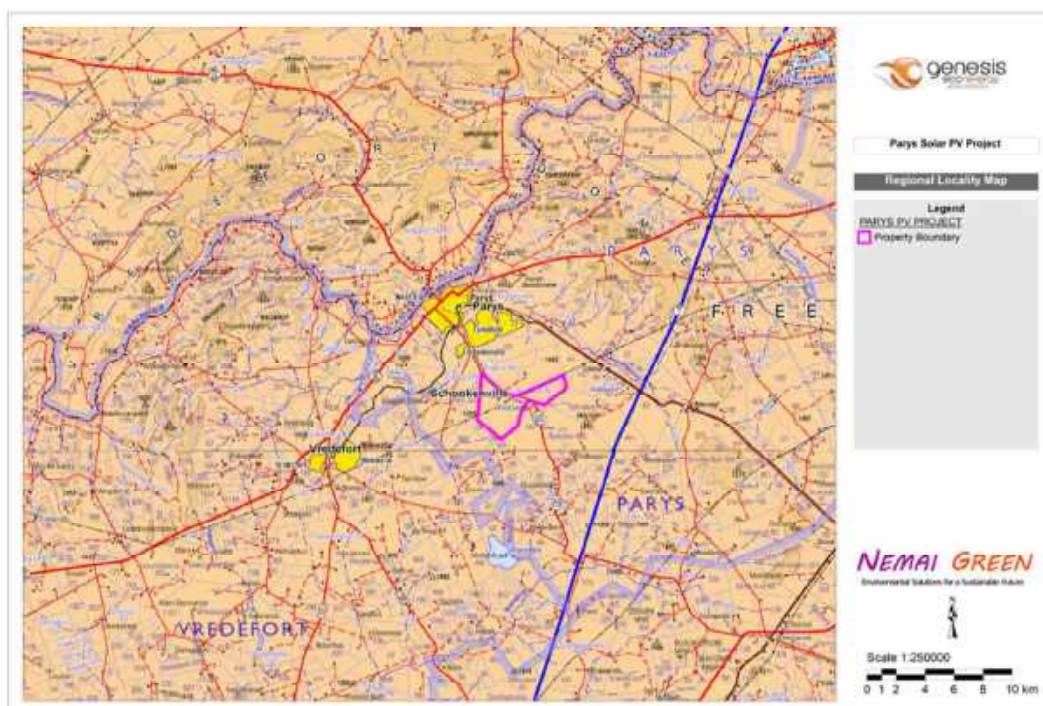


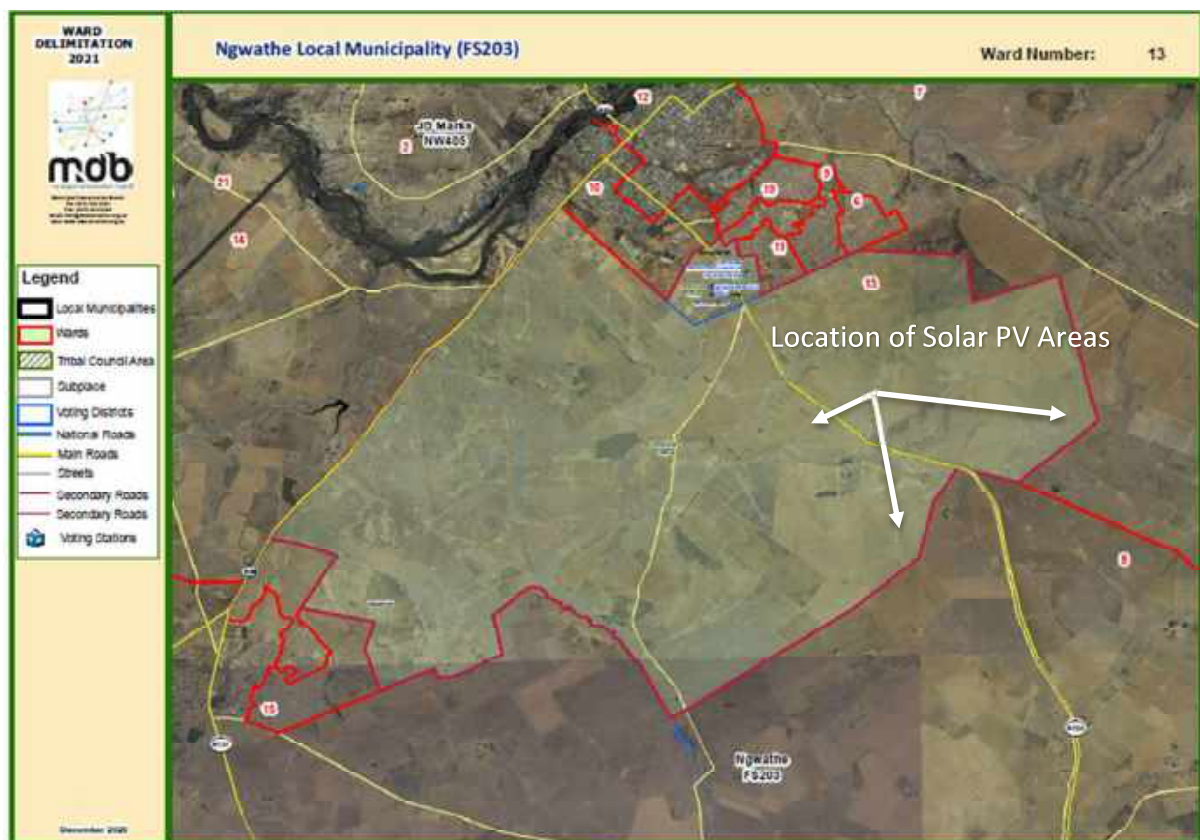
Table 3: Affected Local Municipality

Local Municipality	Affected Wards
Ngwathe Local Municipality	Ward 13

4.2 Local Study Area

The local study area is Ward 13 of the Ngwathe Local Municipality. This area is shown in Figure 3, below. The map was created by the Municipal Demarcation Board in December 2020.

Figure 3: Ward 13 of the NLM



The demarcation of the wards was last revised in 2021, and the figure above provides the current ward location of the project. However, for the purposes of analysis of data for the study area, older ward delineations are relevant. During the period when Census 2011 was conducted, the project location fell within Ward 15 of the municipality – the older Ward 15 and the current Ward 13 share many similarities, with Ward 15 being slightly bigger, covering a peri-urban area of south western Parys, which Ward 13 does not cover.

4.3 Direct Study Area

The direct study area is the area immediately adjacent to the project. This study area is shown in pink in Figure 4 below.

Figure 4: Direct Study Area*Figure 5: Direct Study Area*

5 Methodology

The information presented in this report was obtained through the following data collection methods.

5.1 Sourcing of Information and Data Analysis

The Socio-Economic Impact Assessment sets out the socio-economic baseline of the study area; predicts social and economic impacts and makes recommendations for mitigation of negative social and economic impacts and measures which can be taken to enhance the positive social and economic impacts.

The baseline study is based on both primary and secondary data. Primary data was collected directly from engagements with community members, landowners and business owners. Secondary data was accessed through South African economic and social databases. Articles and internet searches were also used and are referenced in the text and in the reference sections of this report.

The profile of the baseline conditions includes describing the current status quo of the community; including information on a number of social and economic issues such as:

- Demographic data.
- Socio-economic factors such as income and population data.
- Access to services.
- Institutional environment.

- Social Organization (Institutional Context); and
- Statutory and Regulatory Environment.

5.2 Primary Data

5.2.1 Public Participation

The Public Participation Process (PPP) granted Interested and Affected Persons (I&APs) an opportunity to comment on the project during the announcement phase of the environmental impact assessment. Comment and Responses used during this process have been included into this report and have formed one of the bases the analysis of the socio-economic impacts considered in this report.

Further primary data was collected for the purposes of the study; these were collected using the following approaches:

- Rapid Rural Assessment: A survey was conducted to capture visual observations on the social dynamics, community proceedings, community resources and infrastructure.
- Stakeholder Consultations: Consultations with the affected communities carried out by members of the project team along each project component to discuss the proposed project and to gather their concerns and feedback on the project; and
- Key Informant Interviews: Informal discussions with the IAP's to help inform the baseline were conducted during site visits and as well as during the scoping phase. These included community members and authority members.

5.3 Secondary Data

An assessment of the EIA and Scoping phase was conducted to provide an understanding of the project detail, location, and possible impacts.

The required information was collected using different sources, these included Statistics South Africa Census data as well as a review of relevant municipal, district and other literature. The discussion of the demographics and the development profile of the study area is carried out using Census 2011 data produced by Statistics South Africa. The Census 2011 data is the most comprehensive dataset available for the subject areas, and it is currently the best data at hand. Where appropriate this data has been expanded using the survey data generated through the Community Survey 2016, which was released by Statistics South Africa in 2016. The ward and municipal data have been extracted using the project Geographic Information System, and the data for the affected areas will be presented in tables and figures throughout the report.

5.4 Geographic Information System

A Geographic Information System (GIS) was used to conduct an analysis of the area. The use of GIS brings together the demographic and socio-economic data to enable a thorough analysis of the project area.

5.5 Impact Assessment

The identification of the socio-economic impacts associated with the project is issues-based, with the main headings referring to a common theme addressing several related impacts. Under each of these issues, the specific impacts and potential mitigation strategies are discussed for pre-construction, construction, operation, and decommissioning phases.

5.6 Assumptions and Limitations

The following assumptions and limitations underlie this socio-economic impact assessment:

- The information obtained during the public participation phase provides a comprehensive account for the community structure and community concerns for the project.
- The study was done with the information and the time frames available to the specialist at the time of executing the study. The specialist took an evidence-based approach in the compilation of this report and did not intentionally exclude information which is relevant to the assessment; and
- No relocation of families will take place for this project.

6 STUDY AREA STATUS QUO

This section has been compiled from research sourced from the Mangaung Metropolitan Municipality (MMM) and the Free State Province Integrated Development Plan (IDP) giving broad background information on the project area and surrounding municipality. Statistics South Africa and Wazi Map have also been used as a resource for the statistical information and from the recently completed Environment Impact Assessment (EIA) studies. The following section presents the socio-economic profile of the study areas.

6.1 Project Locality Context

South Africa comprises of nine provinces; and the Free State Province is the third largest province in the country; but has the second smallest population and the second lowest population density. The province is situated on the centre of South Africa and borders the provinces of Mpumalanga; Gauteng; Eastern Cape; Northwest; Kwazulu-Natal and the Northern Cape.

The Free State covers an area of 130 011 square kilometres and in the year 2016 it was recorded to have a population size of 2.8 million people and comprises of four district municipalities, one of which is the Fezile Dabi District Municipality in which the project is located. The major towns in the province are Mangaung, Welkom; Odendaalsrus; Sasolburg; Kroonstad; Parys; Phuthaditjhaba and Bethlehem (Mangaung IDP, 2020). Agriculture is central to the province's economy, while mining remains its largest employer (FS IDP, 2020).

Fezile Dabi District Municipality is a Category C municipality, which was established in the year 2000. The municipality is located in northern Free State Province and covers an area of 20 800 square kilometres. The municipality is the smallest district in the province, making up 16% of its geographical area. The district consists of four local municipalities namely Moqhaka Local Municipality; Metsimaholo Local Municipality; Ngwathe Local Municipality and the Mafube Local Municipality. The district's population size is 527 788; with an annual population growth rate of 1.6 %. In 2019, the district had a total of 166 004 households with a population density of 23.8 people per square kilometres (Fezile Dabi IDP, 2020).

The district has several location advantages in sectors such as agriculture; mining; manufacturing and electricity provision. Furthermore, the Vaal Dam is the main source of water and offers a wide variety of leisure facilities.

6.1.1 Ngwathe Local Municipality

Ngwathe Local Municipality derives its name from SeSotho which means "river"; and is situated in the north of the Fezile Dabi District. The Vaal River forms the northern boundary of the area; which also serves as the boundary between the Free State; Gauteng and Northwest Provinces. The major towns in the Ngwathe Local Municipality's areas of jurisdiction include Parys, Vredefort, Heilbron, Koppies and Edenville. The former Transitional Local Councils and section of the former Koepel, Kroonkop and Vaal Dam Transitional Rural Councils also form part of the Ngwathe municipal area. The Renoster River also drains through the region and is dammed up in the vicinity of Koppies, in a series of dams; the Weltevrede; Rooipoort and Koppies Dams. These dams are the main water sources for agricultural purposes in the region (Fezile Dabi IDP, 2020).

The Ngwathe Local Municipality was established in terms of Section 14 of the Local Government (Municipal Structures Act, Act No 117 of 1998) and was published in Provincial Gazette No 184 dated 28 September 2000. The Local Municipality is a category B municipality.

6.2 Demographics

The demographics of the study area for the project can be summarized in this data gathered from Census 2011, undertaken by Statistics South Africa.

Geographic Area	Age Group [No. of People]			
	0 - 19	20 - 64	65 +	Total
Ward 15	1 888	2 293	341	4 522
FS203: Ngwathe	47 032	64 493	8 995	120 520
DC20: Fezile Dabi	180 627	277 740	29 669	488 036

Source: Statistics SA: Census 2011

The table demonstrates that Ward 15, the project study area in 2011, contains a small proportion of the overall population of the municipality.

The Ngwathe Local Municipality covers a geographical area of 7 066.7 square kilometers, and it is home to approximately 118 907 people, which is a decrease from the 120 007 people which was

recorded in 2011. The decrease in the population size could be attributed to various push factors in place at the municipality, including economic and quality of life challenges (Fezil Dabi IDP, 2020). Table 5 provides an overview of the Ngwathe LM demographic data as estimated in 2016.

Table 4: Ngwathe LM Demographic data

Ngwathe LM	
Geographical area	7 067 km ²
Population [No. Off]	118 907
Households [No. Off]	40 910
Population Density	17 people/km ²

Source: Statistics SA: Community Survey 2016

The result of the push factors in the various study areas, can be seen through an analysis of the age breakdown of the areas. This age breakdown is shown in below and is sourced from the Census 2011.

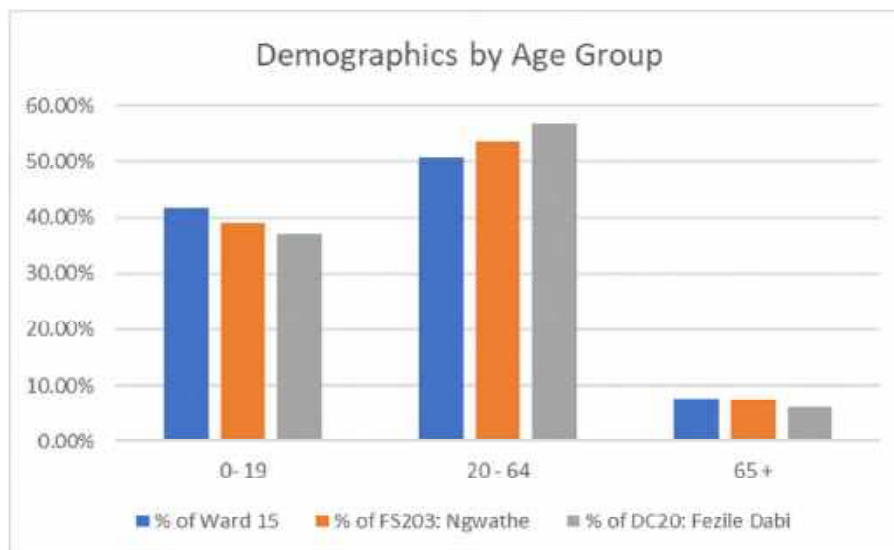
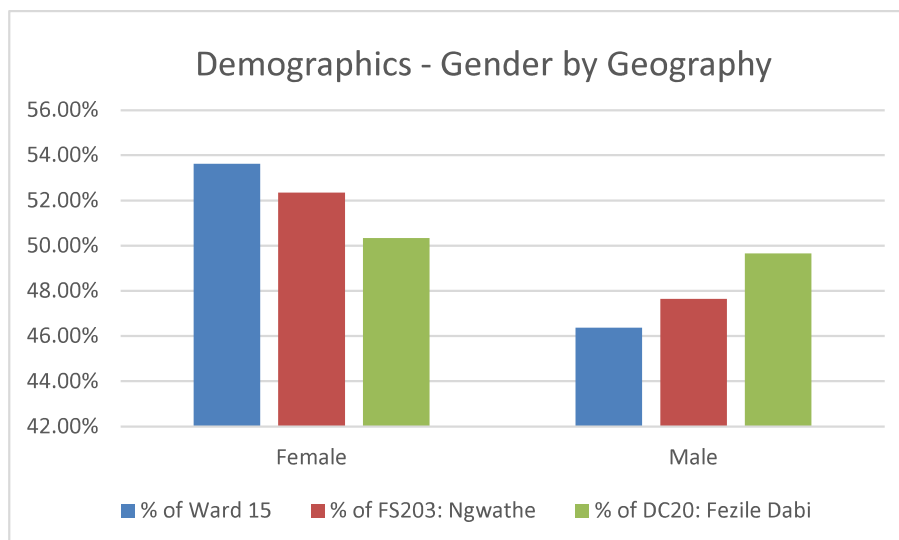


Figure 6: Age Breakdown by Geographic Area

The figure demonstrates that the proportion of younger and older age groups in the project ward are greater than that in the municipality and in the district. It is evident that the working age population is proportionally less in the ward than in the municipality, and which is again less than the proportion in the district municipality. In other words, the proportion of working age population being highest in the district is testament to push factors in place in the Ward and the municipality, resulting in the ward and the municipal population being skewed against economically active residents.

This conclusion is borne out when viewed through a gender lens, and accepting that the nature of the rural environment tends to result in women being more likely to be homemakers than men. Below shows the gender breakdown in the various study areas, sourced from the Census 2011.



The percentage of females in the population of the ward project area, at 54% is significantly higher than in the municipality, at 52% and at the district, at 50%. The proportion of men in each area changes proportionality, and thus the observation can be made that the ward and the municipality are less attractive to men, than the district. Thus, the ward and the municipality are disproportionality populated, when compared with the district municipality, by female, younger and older residents.

6.3 Spoken Language

The spoken languages found in the study area are shown in Table 5 below (Community Survey, 2016).

Table 5: Home Language

Spoken Language	Free State	FDDM	Ngwathe LM	Ward 13
Sesotho	71%	75%	76%	56%
Afrikaans	11%	12%	11%	22%
Isixhosa	5%	4%	6%	13%
Isizulu	2%	4%	1%	2%
Other	2%	2%	1%	3%

Source: Statistics SA: Community Survey 2016

The most spoken language in the Free State; across the district and the local municipality is Sesotho. Afrikaans is the second most spoken language in the regional area; followed by Isixhosa (Community Survey, 2016).

6.4 Education

The South African School Act of 1996 made it compulsory for children between the ages of 7 and 15 (or attendance of Grade 1 to 9) to have access to quality education without discrimination. Table 5 gives an outline of the educational profiles across the regional area (Community Survey, 2016).

Table 5: Education Profile

Geographic Area	Primary School	Some Secondary	Matric	Diploma	Degree
Ward 15	1 629	1 158	863	60	259
FS203: Ngwathe	39 257	34 376	20 714	2 269	8 780
DC20: Fezile Dabi	141 805	138 631	92 692	11 751	32 827

Source: Statistics SA: Census 2011

The table demonstrates that the level of educational attainment for persons above 20 years old, in generally skewed towards a primary school level and some secondary school level education. These figures are confirmed by the below which shows the proportion of each level of educational attainment by geographic area (Census 2011).

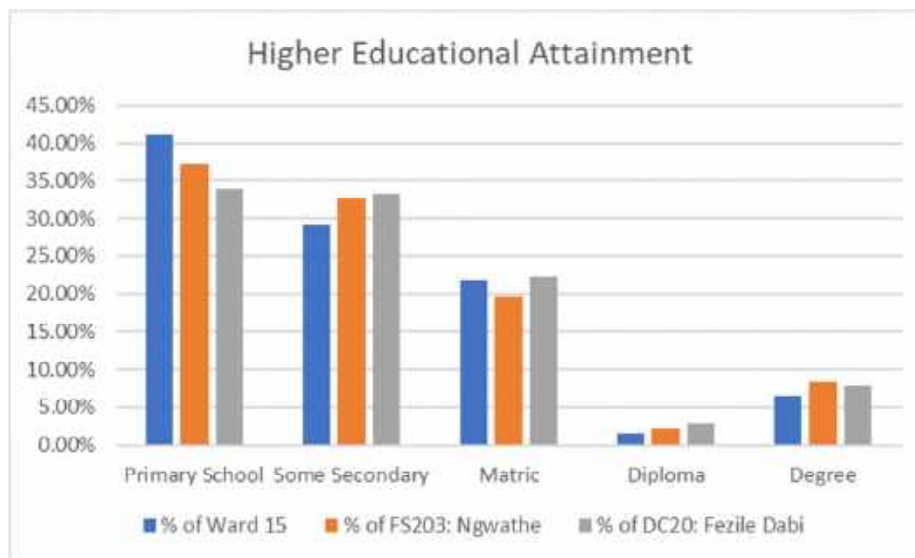
**Figure 7: Educational Attainment by Geographic Area**

Figure 7 above shows that 62% of the ward level population has not completed matric. A further 29 has completed matric as their highest level of attainment. Approximately 8% of the ward level population has completed some level of tertiary education. It should be noted that the population of the municipality and district have completed relatively higher levels of tertiary attainment, with 10% in the municipality and 11% in the district.

This pattern endures through to 2016, as demonstrated by the result of the Community Survey 2016. This survey shows that the levels of educational attainment of individuals over 20 in Ngwathe LM include "Some Secondary School" (37%), "Some Primary School" (16%); "Primary School" (6%); and "No Schooling" (5%). Together these lower levels of attainment comprise 64% of the population. The level of those who have attained "Some Secondary School" is higher compared to those who completed matric in the Ngwathe Local Municipality (30%). These figures demonstrate that the population continues to demonstrate low levels of academic attainment (Community Survey, 2016).

It can be concluded that most of the population living in the study area does not have a level of education that generally allows for skilled workers. It is thus to be expected that the local labour sending areas will be provide a significant proportion of unskilled and semi-skilled skilled workers.

6.5 Economic Development Indicators

The Fezile Dabi District's economy comprises the manufacturing industry, at 27% of the district's GVA. The second highest contributor is the mining industry at 18%, followed by community services at 13%.

The Ngwathe Local Municipality has 24% of the district's population and it makes 9.4% of the economic contribution in the district. The main economic contribution comes from the community services sector. The Vaal River and the Vredefort Dome are tourism generators, however, the municipality largely depends on the agrarian economy with pockets of industry and commerce existing in the urban centers. Heilbron is the agro-processing hub in the municipality (Municipal IDP, 2021-2022).

Table 6: Household Income, Census 2011

Geographic Area	Annual Household Income [R]			
	No income	R 1 to R 19 600	R 19 601 to R 153 800	R 153 801 or more
Ward 15	207	506	496	46
FS203: Ngwathe	4 831	14 376	15 245	2 649
DC20: Fezile Dabi	16 737	48 781	63 610	15 849

Annual household income is lower across the ward, municipal and district level. Fifty six percent of the households in the ward survive on less than R1 630 per month. Equivalent figures are 52% at municipal level and 45% at district level. Thus, the ward level population are appreciably poorer than residents of the rest of the municipality and of the district.

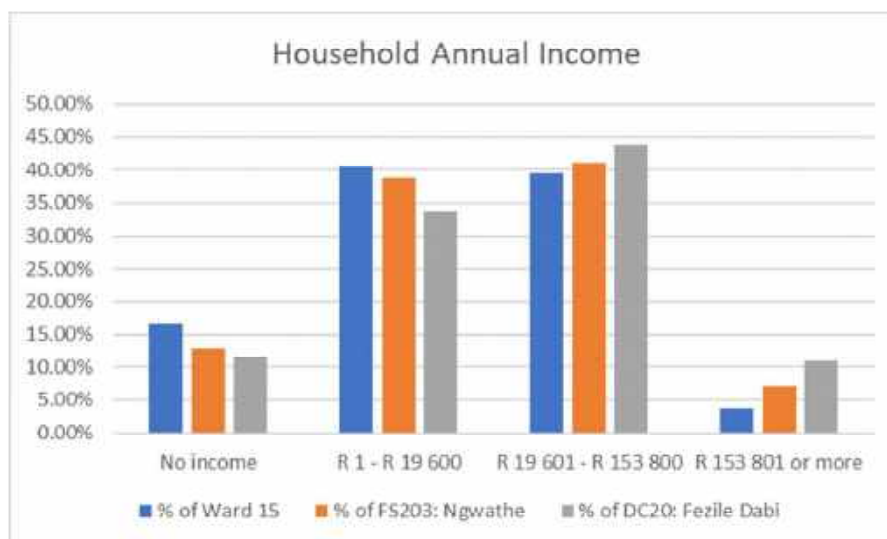


Figure 8: Household Annual Income, Census 2011

Figure 8 above demonstrates the imbalance in income, with ward residents having lower proportions of the higher two income bands when compared with residents of the municipality and the district.

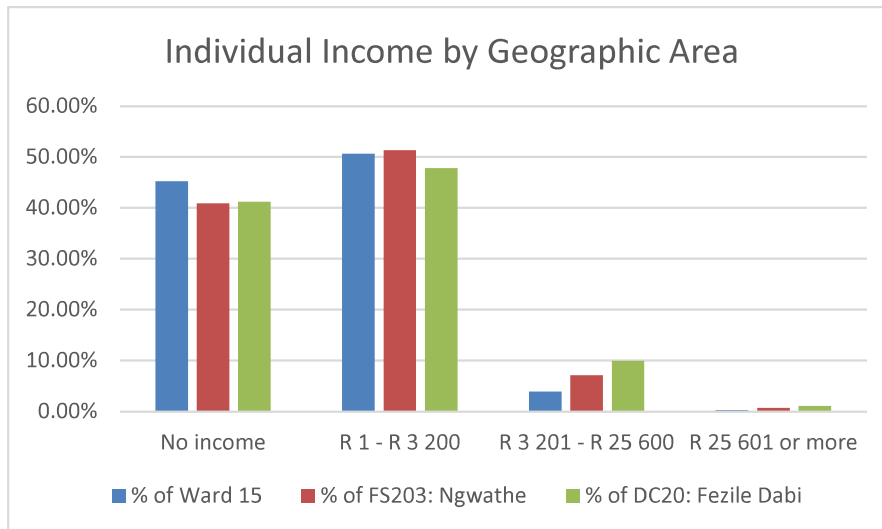


Figure 9: Individual Income, Census 2011

The same pattern is reflected in individual income, where 96% of the ward population had income less than R3 200 per month in 2011, with fully 45% of the individuals in the ward having no income at all.

6.6 Labor Force

Using information from Census 2011, the employment data across the study area were as shown in Table 7 below.

Table 7: Employment and Unemployment, Census 2011

Geographic Area	Employed	Unemployed	Discouraged work-seeker	Other, Not Economically Active
Ward 15	637	583	232	1 296
FS203: Ngwathe	25 635	13 920	3 865	31 823
DC20: Fezile Dabi	117 732	60 344	13 687	129 445

Figure 10 below outlines the different employment and unemployment rates from Census 2011.

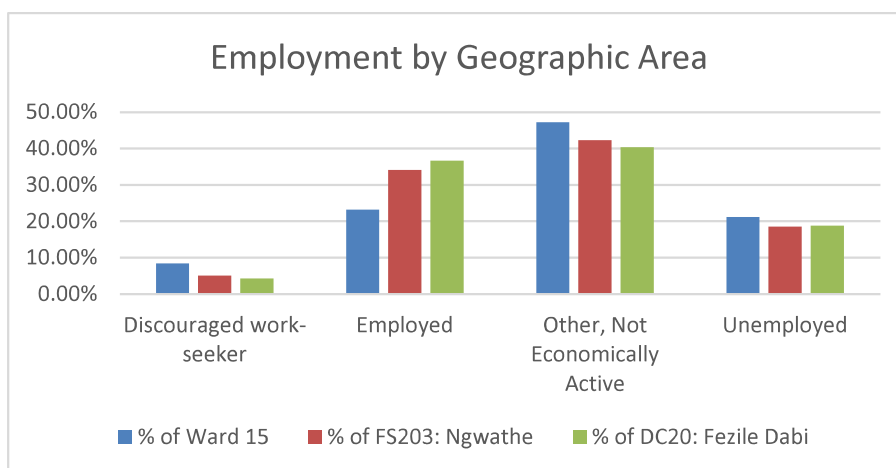


Figure 10: Employment and Unemployment rates

The data shows that the simple unemployment rate in the ward was 21%, compared to 19% in the municipality. If discouraged work seekers were added to the tally, to create an expanded definition of unemployment, the rates would be 30% for the ward and 23% for the municipality.

It is concluded that the unemployment rate is high across the provincial; district and municipal level which can be partly attributed to the low educational attainment achieved in the study area.

6.7 Household Service Level Indicators

6.7.1 Housing

The Ngwathe Local Municipality has a population of 118 906 people living within 40 910 households; which is an increase from the 37 102 households recorded in 2011; however, the average household size slightly decreased from 3 persons per household in 2011 to 2.9 persons per household in 2016 (Community Survey, 2016).

The 2016 Community Survey revealed that there is an increased number of people living in formal houses when compared to those living in shacks/informal dwellings. The Fezile Dabi District Municipality has approximately 132 379 (78%) of people living in houses with 23 537 (14%) of people living in informal dwellings. The Ngwathe Local Municipality has 33 259 (81%) of people living in houses and 5 443 (13%) of people living in informal dwellings. This is less than the rate at the district level (Community Survey, 2016).

6.7.2 Electricity

By 2016, people with access to electricity for cooking in the study area comprised 88% of households in Ngwathe Local Municipality. This is about ten percent higher than the rate in both the Fezile Dabi District Municipality, at 80%, and the Free State Province at 82% (Community Survey, 2016). There is a small proportion of households that are without electricity and Ngwathe Local Municipality accounts for 4 856 individuals (4%) and with the Fezile Dabi District Municipality at 32 081 individuals, 7% (Community Survey, 2016).

6.7.3 Access to Sanitation

The community survey carried out in 2016 reports that the residents with access to flush or chemical toilets at the Ngwathe Local Municipality was 81%, compared to 83% of the population in the Fezile Dabi District Municipality.

There are households making use of the bucket system, with those in the Ngwathe Local Municipality accounting for 11 859 (10%) households and 29 414 (6%) across the district (Community Survey, 2016).

6.7.4 Access to Water

Access to water by households in 2011 was dominated by those with water supply inside the dwelling, followed by households with access to water inside their yard. Figure 11 below shows that 99% of households in the water had access to either one of those two service levels.

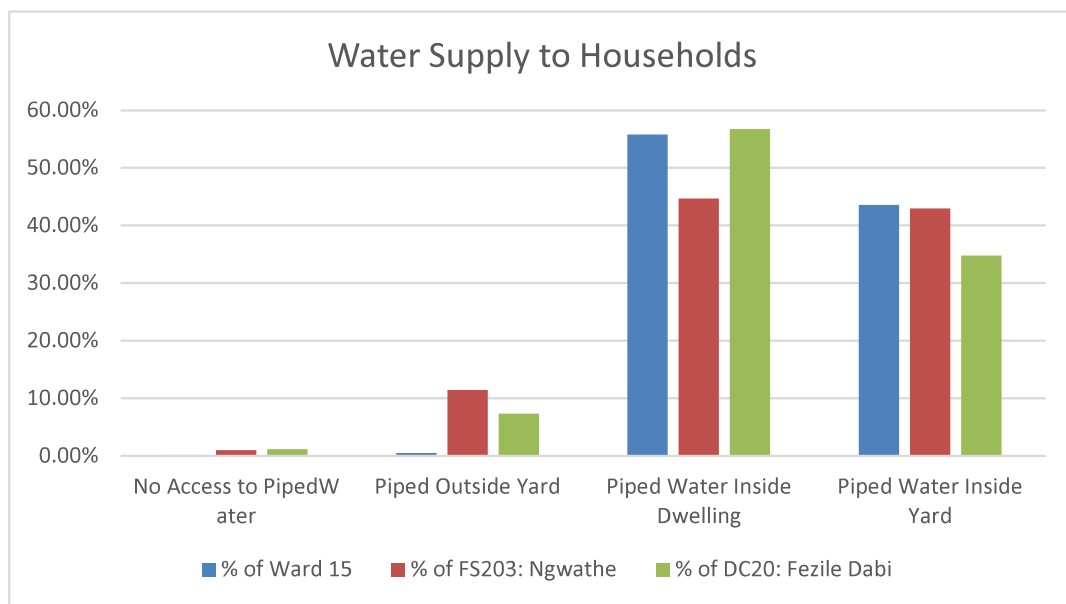


Figure 11: Household Access to Water

Source: Statistics SA: Census 2011

The data shows that relatively fewer households in the municipality had access to water inside their dwellings – 45%, and within their yards – 43%. Together these two service levels make up 88% of the households in the municipality.

6.7.5 Child headed households.

The municipal study area has a total of 179 households which have heads of household under the age of eighteen. This is about one quarter of the figure in Fezile Dabi, which has 751 such households. Of those households, the majority live in houses; in the Ngwathe Local Municipality 75%, and Fezile Dabi District Municipality, 69% (Community Survey, 2016).

According to the Community Survey, 2016 there are more child headed households which have females as their heads in the Ngwathe Local Municipality 104 (58%) compared with the Fezile Dabi District Municipality which has of more male child headed households; 411 (55%).

The distribution over time of child headed households in the municipal study area are summarized in Table 8 below.

Table 8: Distribution of child headed Households: Ngwathe LM

Description	1996	2001	2011
Child headed households	277	376	198
Total households	29 575	32 108	37 102
% of child headed households	0.5	1.2	0.5

Source: Community Survey 2016

7 LOCAL STUDY AREA OVERVIEW

The local study area comprises of the project boundary and its close neighbours. The following discussion captures the areas of potential socio-economic impacts on a radius of 5km.

7.1 Land Use and Infrastructure

The project is located on the ideally transformed agricultural land which is approximately 14km to the south of Mangaung's central business district. The area falls within Ward 51 of the Mangaung Metropolitan Municipality (MMM), in the Free State Province.

The dominant local land use in the area is the N6 highway, agricultural zoned land, low density homesteads around the project site also characterized by part of the Ferreira suburb on the western boundary and Caleb Motshabi as well as Bloemanda suburbs on the eastern boundary of the project site.

The land use and infrastructure characteristics of each component is described below. This section of the report relies upon a census of the infrastructure and land-use impacts that has been conducted for this study. The results of the census are contained in **Appendix 1**.

7.2 Solar Park

The solar park's components formulate the main segment of the project. The below image depicts the components of a solar power plant design, and the concept is applicable to the proposed Paradise Solar PV Farm.

A Google Earth image of the proposed solar park layout is shown below.



Figure 12: Proposed Solar PV Park Layout

Coordinates of the properties and infrastructure directly impacted by the project, within a 5km radius are listed in the table below.

Table 7: Coordinates of the Property Directly Impacted

Category / Name	Co-ordinates
Farm structures	29°17'18.47" S 26°12'25.16" E
Residential/House	29°17'18.85" S 26°12'35.66" E
Farm structure 1	29°17'26.08" S 26°11'54.35" E
Farm structure 2	29°17'24.83" S 26°11'36.53" E
Manmade water catchment feature	29°17'38.02" S 26°11'54.17" E
Residential dwellings / houses 2	29°16'34.73" S 26°11'20.26" E
Onze Rust Landgoed - Wedding venue	29°16'38.84" S 26°11'20.80" E
Panaromio place	29°16'37.52" S 26°11'13.77" E
Fereira Suburb	29°13'22.69" S 26°10'34.33" E
Natural water feature	29°12'34.96" S 26°12'05.86" E
Natural water catchment area	29°12'23.19" S 26°12'37.72" E
Farm Dwellings/ Houses	29°13'20.53" S 26°12'25.08" E
Suburb	29°12'53.48" S 26°13'55.80" E
Farm dwellings 3 and a water catchment area.	29°13'32.54" S 26°12'53.81" E
Farm dwellings 4 and water catchment area.	29°13'52.46" S 26°14'06.19" E
Natural water catchment area	29°13'57.88" S 26°14'18.66" E

Category / Name	Co-ordinates
Farm dwellings 5	29°14'01.32" S 26°14'25.33" E
Informal Settlements Suburb 2	29°13'41.71" S 26°15'02.66" E
Farm dwellings 6	29°14'13.17" S 26°13'11.71" E
Natural water catchment area	29°14'15.06" S 26°13'57.66" E
Farm dwellings opposite proposed project site	29°14'47.46" S 26°12'57.61" E
Farm dwellings opposite proposed project site 2	29°14'52.05" S 26°13'16.29" E
Farm dwellings opposite proposed project site 3	29°15'26.63" S 26°13'09.87" E
Farm dwellings adjacent proposed project site 4	29°15'44.29" S 26°12'48.41" E
Farm dwellings adjacent proposed project site 6	29°15'46.53" S 26°12'37.74" E
Farm Dwellings 7	29°16'16.81" S 26°12'46.17" E
Farm Dwellings 8	29°16'29.86" S 26°12'37.70" E
Farm dwellings 9, three adjacent properties	29°16'57.52" S 26°12'42.58" E
Farm dwellings 10	29°17'31.28" S 26°12'43.55" E
Properties located along N6 and Mangaung road	29°16'56.18" S 26°12'41.64" E

7.3 Stakeholder Engagement

The World Bank's Environmental and Social Framework (2018:97), defines the stakeholder engagement process as a process that is inclusive and conducted throughout the project life cycle. The procedure further supports the development of strong, constructive, and responsive relationships that are important for successful management of a project's environmental and social risks.

The following stakeholder engagement methodologies were carried out as part of either the public participation process of an earlier Scoping process and as part of direct contacts with the affected parties.

7.4 Comments Made by the Public

The process of collating of public comments was done through the Scoping stage in March 2022. An advertisement was placed in the Bloem Nuus and in the Mangaung Courant, site notices were placed near and around the project site. A database of the potentially affected parties and community elected representatives were sent email notifications which included a Background Information Document. This document provided an overview and description of the proposed project.

An opportunity was thus provided to identified Interested and Affected parties, as well as the general public at large, to provide their comments on the proposed project. Some of the comments highlighted a socio-economic concern. The below table summarises the relevant inputs.

Table 9 : Socio-Economic Comments at Scoping Phase

Socio-Economic Comments
My name is Godfrey from Parys in Schonkenville near the Leeuwkuil farm, I would like to apply or propose for the site contracting, I'm confident that I meet the desired requirements for any job that can be. offered, I'm available for any job offered to me, I'm available for the interview if required.

The proposed project area lies on previously used agricultural land similarly to adjacent properties. Landowners live on this property and many farm labourers are employed in these farms. From an agricultural perspective the construction of the solar park will lower the agricultural yield in the area and a concern has been raised that this be an impact of the project. The impact lies in choosing to use productive agricultural land instead of unused land within the project area. The fear is that the agricultural land will be lost and as a result there will be changes in the farming communities.

In this regard, the findings of the agricultural impact assessment section of the Environmental Impact Assessment process should be adhered to. The impact assessment contained in this report defers to the findings of the agricultural impact assessment.

7.4.1 Primary Data Collection Report

To fully capture the impacts posed to the Interested and Affected parties a baseline study of the area's infrastructure was conducted on google earth. The analysis of properties and infrastructures were observed within a 5km radius around the project area as guidance.

7.4.2 Rapid Rural Assessment Process.

A site visit was conducted 10 January 2023. The purpose of the visit was to compile and collect primary data on the receiving social environment. And to understand the expectation of the local people with reference to the proposed project. During the site visit tour, the following socio-economic aspects were observed on the receiving environment.

The R723 regional road passes through the proposed site, leading north to Parys. The closest suburbs of Parys to be project are Schonkenville and Tumahole, located approximately two kilometres from the project site boundaries. Primary languages in the area are Afrikaans, English and Sesotho.

Adjacent to Tumahole is an informal settlement housing livestock farmers. This settlement does not have basic services provision such as water, electricity, and sanitation.

Approximately 2.6 kilometres to the south of the project boundary is the Parys Pigeon Farm, which is used as a hunting area.

The images in the following table depict the observations of the key places visited.



Cattle on Adjacent Land



A Graveyard Adjacent



Vredefort Dome



Livestock Farmers Informal Settlement



Tumahole Fast Food Shop



Sanctuary Church, Tumahole



The area surrounding the project site is grazing land. Local small scale livestock farmers live opposite the site, along the R73, and tend to sheep, goats and cattle. Through interviews with the inhabitants, their primary concern was a fear of grazing land being lost, and that the informal settlement may be relocated.

There is an existing graveyard close to the project area, close to Tumahole. The boundaries are not clearly demarcated, however gravestones are visible. To mitigate this, a fencing around the graveyard and signages will need to be in place. The project team and the labourers will need to be cautioned about the sensitivity of the area.

Approximately 4 km from the project boundaries to the south there is the Vredefort Dome. As per <https://whc.unesco.org/en/list/1162>, the property represents a unique geological phenomenon formed about 2 023 million years ago and is the oldest and largest known meteorite impact structure on earth.

Schonkenville suburb, the farmers' informal settlement, and Tumahole, a high density suburb of Parys, some two kilometres from the site are the closest human receptors for the project.

7.4.3 Social assessment informant survey

According to Barrow, CJ (2000) shows that the purpose of random interviews is to involve the diverse public, all groups in decisions making even from those that are reluctant or marginalised. The following random interviews took place with the listed people in the table below.

Table 10: List of Interviewed People

Name	Designation	Number of years living in the area
Rebone M	Resident at Schonkenville	8 Years
Siloane T	Resident at Schonkenville	3 years
Loveness C	Resident at Tumahole	2 years

Tumisho R	Farm worker	4 Years
Lerato M	Resident at Tumahole	9 Years
Hendrick P	Resident	1 year

The purpose of the face-to-face stakeholder interactions were to establish and record unbiased views and or comments of the proposed project, as to ensure that all comments and issues raised during the EIA phase is included into the SIA report which will be submitted to DEA and the information about the project has been properly disseminated to the local community.

The overall attitudes and perceptions of the interviewed people where their positive expectations from the project. The consensus was that economic opportunities are not adequate for the population and that additional investment in the areas was welcomed. Load shedding has made unemployment challenges worse, especially for the youth and women. The common factors behind the perceived socio-economic challenges were the shortage of basic services such as water which was heavily impacted by the electricity shortages. Many of the group reported the electricity challenges have led to business closures and jobs being lost.

8 IDENTIFICATION OF IMPACTS

8.1 Impacts and Mitigation Framework

Socio-economic impacts are expected to arise because of a proposed project. All impacts discussed in this section will follow a context of nature, extent, magnitude, duration, probability, and significance.

ISO 14001-2004 defines impacts as “any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization’s environmental aspects”.

When considering an assessment of the impacts and their mitigation, the following definitions as per Table apply.

Impact and Mitigation Quantification Framework

Nature	The project could have a positive, negative, or neutral impact on the environment.
Extent	Local – extend to the site and its immediate surroundings. Regional – impact on the region but within the province. National – impact on an interprovincial scale. International – impact outside of South Africa.
Magnitude	Degree to which impact may cause irreplaceable loss of resources: Low – natural and socio-economic functions and processes are not affected or minimally affected.

	<p>Medium – affected environment is notably altered; natural and socio-economic functions and processes continue albeit in a modified way.</p> <p>High – natural or socio-economic functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.</p>
Duration	<p>Short term – 0-5 years.</p> <p>Medium term – 5-11 years.</p> <p>Long term – impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.</p> <p>Permanent – mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.</p>
Probability	<p>Almost certain – the event is expected to occur in most circumstances.</p> <p>Likely – the event will occur in most circumstances.</p> <p>Moderate – the event should occur at some time.</p> <p>Unlikely – the event could occur at some time.</p> <p>Rare/Remote – the event may occur only in exceptional circumstances.</p>
Significance	<p>Provides an overall impression of an impact’s importance, and the degree to which it can be mitigated. The range for significance ratings is as follows-</p> <p>0 – Impact will not affect the environment. No mitigation necessary.</p> <p>1 – No impact after mitigation.</p> <p>2 – Residual impact after mitigation.</p> <p>3 – Impact cannot be mitigated.</p>
Mitigation	<p>Information on the impacts together with literature from socio-economic science journals, case studies and field work will be used to provide mitigation recommendations to ensure that any negative impacts are decreased, and positive benefits are enhanced.</p>
Monitoring	<p>Monitoring usually involves developing and implementing a monitoring programme to identify deviations from the proposed action and to manage any negative impacts. The recommended mitigation measures will also include monitoring measures.</p>

A well-designed, well implemented, professionally managed solar park can bring significant socio-economic benefits to the communities that it serves. If configured or operated in a way that ignores significant socio-economic needs or potential impacts, the proposed project may have significant socio-economic costs or liabilities for the stakeholders and affected communities.

Therefore, assessing socio-economic impacts is a complex process due to the multi-dimensional nature of the human interactions. This occurs in situations where a particular impact affects a group of stakeholders differently. An inter-connection of impacts can also be encountered whereby several impacts are related and when assessed cumulatively; their impacts may be of significance.

The impact assessment scores both before and after mitigation were arrived at by the specialist team engaging in a modified version of the Delphi technique, where the team discussed the scores, and through a process of iteration arrived at a consensus for each of the values. Where additional information was needed to decide, the technique would be halted, the necessary information would be uncovered and included in the report, and the technique would be recommenced.

8.2 Identification of Activities and Aspects

An “Activity” is defined as a distinct process or risks undertaken by an organisation for which a responsibility can be assigned. Activities also include facilities or pieces of infrastructure that are possessed by an organisation (International Organization for Standardization, 2011).

An aspect is defined as elements of an organisation’s activities, products, or services that can interact with the environment.

To capture the impacts associated with the proposed infrastructure, an activity – aspect – impact table was created refer to Table 11 below.

Table 11: Activity, Aspects and Impacts of the Project

Activity	Aspect	Potential Impact – Positive	Potential Impact – Negative	
Land and Servitude Rights Acquisition	Land Acquisition		Loss of agricultural production	
			Loss of land (including structures and cultivated areas) through project infrastructure	
	Servitude Rights		Some restrictions on use of productive land	
Scheme Operations	Electricity generation	Economic growth and induced impacts.		
	Supply of goods and services to the project	Opportunity for local business		
		Opportunity for local labour force		
	Administration and Technical Input	Employment of staff locally Skills development		
Construction Phase	Access into properties		Security Concerns	
	Solar Park Construction – piling, frame erection and solar panel mounting, electrical installation and rehabilitation	Employment of people locally		
		Sourcing of equipment, machinery, and services locally		
				Noise
				Dust
		Employment of local people		
		Influx of people seeking employment and associated impacts		

Activity	Aspect	Potential Impact – Positive	Potential Impact – Negative	
			(e.g., cultural conflicts, squatting, demographic changes, anti-social behaviour, and incidence of HIV/AIDS)	
		Sourcing of equipment, machinery, and services locally		
	Transport of goods to site and employment of staff		Increased traffic	
			Noise	
	Transmission Line		Employment of people locally	
				Security concerns when contractor's access private property
			Sourcing of equipment, machinery, and services locally	
	Rehabilitation			Damage or wear to access roads
				Security Concerns
				Damage to property or equipment

8.3 Impact and Mitigation Assessment

Taking these impacts into account and based on the project description as well as the applicable legislation and policy and planning issues, the following socio-economic impact variables have been identified as being associated with the project. These impacts are in accordance with Vanclay's list of socio-economic impact variables (Vanclay, 2002; Wong, 2013) clustered under the following seven main categories as follows:

Health and well-being impacts

- Annoyance, dust, and noise.
- Security.
- Increased risk of HIV and AIDS; and
- Personal safety, increased hazard exposure.

Worker Health and Safety

- Construction site risks;
- Exposure to disease; and
- Gender considerations in employment.

Quality of the living environment (Liveability) impacts

- Disruption of daily living activities; and
- Perceived quality of life.

Economic and material well-being impacts (positive)

- Increased economic activity;
- Increase in employment opportunities; and
- Increased opportunities for Small Medium and Micro Enterprises (SMME).

Economic and material well-being impacts (negative)

- Loss of land for productive agriculture.

These categories are not exclusive, nor fully inclusive of the project specific impacts, and at times tend to overlap as certain processes may have an impact within more than one category.

Cumulative impacts can be both positive and negative. Cumulative impacts refer to the impacts that are incremental on the environment that results from the impacts of the proposed action when added to the existing and near future actions. These impacts can also be temporary in nature (by being restricted to the construction phase) and permanent (occurring in both the construction and operation phase).

8.4 Impacts during the Planning Phase

The planning phase of any project ensures the analysis of potential impacts, this allows the assessment of any risk to be measured from a scale of high, medium, or low. This pro-active approach ensures the identification of key socio-economic issues that can be mitigated before moving further to other phases of the project development.

The assessment of the key social issues for the proposed Paradise Solar Farm were identified based on the project related information including specialist studies, primary data collection methodologies, project team's familiarity with the project area, experience with similar project studies and in accordance to key policy and planning documents such as the following.

- National Development Plan (NDP);
- Renewable Independent Power Producer Programme (RIPPP).

8.4.1 Institutional, legal, political and equity

The institutional, legal political and equity impacts associated with the project include:

- Attitude formation towards the project;
- Decreased level of community participation in decision making, loss of empowerment; and
- Compliance with municipal by-laws.

There are no directly impacted communities who will be displaced by the project. In this sense there will be no reduction in the level of community participation in decision making resulting in loss of community empowerment. Communities who will be most affected will be those from labour sending areas. Communities of farmworkers in the vicinity of the solar park will not be impacted in their daily lives, apart from seeing a change in land use from agriculture to solar photovoltaic harvesting.

Although there does not seem to be any significant attitude formation towards the project, it remains important for the project proponent to ensure that a communication channel is created between the project proponent and the public. Any reasonable public concerns will need to be addressed through a transparent and swift process.

The Public Participation Process (PPP) provided a channel through which stakeholder can engage with the project proponents and environmental and social compliance consultants to ensure that they have input in respect of decisions affecting them and needs to be carefully and thoroughly planned. This process yielded low levels of engagement with the project and the changes that it might entail for daily community life.

8.4.2 Compliance with municipal by-laws

It is important that the by-laws of the Ngwathe Local Municipality are understood and complied with to ensure that the environment and the public remain safe and secure. The construction site will be approximately two kilometres from an urban area of Parys, and in this sense will not be directly impacted by the majority of municipal by-laws.

There is however one by-law that the project proponent should be aware of and adhere to in order both to comply with the legal framework, to be a good neighbour and responsible corporate citizen. The applicable by-law is:

- Control of Street Vendors, Peddlers or Hawkers By-Law–this by-law controls informal trading with respect to locations to trade, hygiene and nuisance standards, the need for a permit and sets conditions under which goods and stalls will be impounded. This by-law would be applicable to control any informal trading that springs up near the site because of construction activity; and
- Fire and Emergency Services By-Law – the bylaws set the fire protection requirements for buildings and control the storage and transport of hazardous and dangerous goods.

8.4.3 Gender relations

Gender refers to the characteristics attributed to males and females by society and is associated with available power and resources. These characteristics, together with the associated power and resources, vary widely between cultures and tend to change over time. The gender relationships associated with the project may include.

- Cultural resistance towards women; and
- Division of labour.

Cultural resistance towards women

Although equal access to employment across gender lines is a recognised right, the application of this right is often executed without careful consideration of the factors that may frustrate this right amongst women in the workplace. In this regard women are often subjected to cultural factors within the workforce from both peers on the job and from management who may resist both employing and promoting women, often based on cultural prejudices. Consequently, the International Labour Organisation points out that:

“Societies therefore have an obligation to create conducive social environment for all their citizens to be able to exercise their right to work, fully utilizing their human potential. Furthermore, evidence has shown that when women are employed and have their own income in their hands, there exist both direct and indirect social benefits for themselves and their households” (Otope, 2014, p. 1).

With the employment of women during the construction and operational phases of the project it is important to ensure that cultural factors do not hinder the process of employing women and ensuring that they enjoy equal opportunities to men in the workforce.

Division of labour

Following on from the above, the division of labour is a critical aspect that will also lead to various impacts during both the construction and operational phases of the project. During the construction and operational phases of the project women will be integrated into the workforce, however, this will come with various challenges. Women and men work on different tasks, have different biological, sex, gender and health needs, and have different roles within the family, all of which need to be considered in order to create a workplace, without discrimination, that is accessible to both women and men on an equal basis (World Health Organization, 2006).

In introducing women into the workforce, it must be noted that women are over-represented amongst the poorer sectors of society, particularly within the more rural communities, and under-represented, both vertically in terms of responsibility and seniority as well as horizontally in respect of certain functional areas and job categories (Otope, 2014, p. 22). This is especially the case in the local project area where the proportion of women to men is higher than the provincial average. Thus, the potential labour force is dominated by women.

As a result of the analysis above, the following impact/mitigation table has been generated.

Table 12: Institutional, Legal, Political and Equity Impact/Mitigation Table

Environmental Feature	Institutional, Legal, Political and Equity					
Project life cycle	All Phases					
Potential Impact	Proposed Management Objectives / Mitigation Measures					
Attitude formation towards project	Promptly deal with any raised expectations amongst communities regarding perceived benefits associated with the project, through a process of communication and consultation.					
Project information queries and raised concerns	Promptly address any concerns raised by the public in a transparent manner.					
	Where necessary always provide prompt and clear feedback to communities.					
	Include all relevant community members in decisions affecting them.					
Compliance with municipal by-laws	Ensure that all municipal by-laws are complied with.					
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Site	Moderate	Short term	High	2
After Mitigation	Negative	Site	Low	Short term	High	1
Significance of Impact and Preferred Alternatives	The impact on project progress could be significant if grievances are not addressed. This can be effectively mitigated through the establishment of a grievance procedure and adherence to local by-laws					
	The impact has no impact on project alternatives.					

As a result of the analysis above, the following impact/mitigation table (Table 13) has been generated.

Table 13: Gender Relations Impact/Mitigation Table

Environmental Feature	Gender Relations
Project life-cycle	Construction Phase
Potential Impact	Proposed Management Objectives / Mitigation Measures
Cultural resistance towards women	<ul style="list-style-type: none"> Sensitise staff in respect of gender sensitive issues that are pertinent to the workplace.
Division of labour	<ul style="list-style-type: none"> Ensure gender inclusivity and equity with respect to all compensation.
	<ul style="list-style-type: none"> Prioritise gender inclusivity and equity in access to resources, goods, services and decision making with the aim of empowering women.
	<ul style="list-style-type: none"> Promote equal job opportunities for women and men during the construction and operational processes.
	<ul style="list-style-type: none"> Prioritise and articulate gender inclusivity and equity in the project documents by including specific strategies and guidelines for implementation.
	<ul style="list-style-type: none"> The project documents should also include clear mechanisms through which the actual implementation of the activities and the impact on the ground can be monitored and evaluated.

	<ul style="list-style-type: none"> Develop a grievance procedure to specifically address gender matters. 					
	<ul style="list-style-type: none"> Factors such as culture should be considered when planning for gender activities since they play a great role in influencing gender relations. 					
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Site	Moderate	Short term	High	2
After Mitigation	Negative	Site	Low	Short term	High	1
Significance of Impact and Preferred Alternatives	<p>The impact on project equity promotion would be moderate if this impact were not addressed. This can be effectively mitigated through policy and implementation of policy.</p> <p>The impact has no impact on alternative route selection.</p>					

8.5 Impacts during the Construction Phase

The construction activity will impact the social environment both positively and negatively. Given the nature of the project area, construction activity is likely to cause several social nuisances as well as possible economic implications on the communities and commercial activities. With a project of this nature, most social impacts are experienced during the construction phase, as this is when construction related activities, relating to the influx of labour and the use of construction machinery occurs.

8.5.1 Economic Opportunity

The project will create meaningful economic stimulus to the local economy during the construction phase.

In addition to the economic value added, the construction phase was estimated to produce some 578 job years in the regional study area. Considering experience with renewable project implementation in South Africa, 46 job years (8%) are likely to accrue to females, and a total of 236 job years (41%) are likely to accrue to youth.

The official youth unemployment rate in the region is likely higher than the general unemployment rate, this being the trend nationwide. This project has the potential to impact positively on this rate should employment practises targeted at workers (male and female) under 35 years old be adopted.

The high number of impoverished households shows that there are vulnerable communities in the study area. It is recommended that the appointed contractor use local SMME's and local unskilled labour as far as possible during the construction phase to enhance any local economic impact. In addition, this would increase the skills in the area after construction is completed.

In this way more project revenue will stay in the area, raising economic activity and increasing welfare, resulting in induced economic opportunity. In South Africa, most employment is generated through small and medium business. Given the size of the proposed project, should contracts between local

SMMEs be implemented, it is likely that there will be an increase in employment by SMMEs for the duration of the contracts.

In particular, the project has the potential to create several opportunities for existing and new local SMMEs. These opportunities range from site clearing, to fencing, parts of the construction scope and supply of materials. There are also opportunities for community members to provide labour, catering, accommodation, and other services to the new workers.

Where possible, the project proponent should support and encourage the development of SMMEs and local or regional suppliers in line with government policy.

Education levels provide an indication of the level of skill in the community and the degree to which skills can be skilled. Rural and less developed areas are mostly defined by poverty, while poverty is associated with poor education outcomes.

Attempts to break the poverty cycle of the project areas will require more than secondary school education. Higher education or further skills training is required. It is therefore important that the community members under-go skills development. It is also recommended that the project proponent institute a skills development program during construction.

The project proponent should monitor the employment process. Employment audits should be conducted. It is important that women are also provided employment opportunities. Audits should pay attention to the employment process of women to ensure that exploitation does not take place.

8.5.2 Noise and Dust

During the construction phase, there is a potential for communities to be exposed to increased dust, noise other nuisance disturbances. The site is in an isolated area where the number of community receptors is limited to a handful.

The generation of dust stems from activities such as clearing of vegetation, piling and vehicle movement during the construction phase. This situation will be worst during the dry season and during windy seasons. Airborne particulates may pose a hazard to residents downwind of the construction site that suffer from upper respiratory tract problems. Mitigation through dust suppression will allow for this impact to be effectively managed.

During the construction, equipment will be required for the site clearance, and during piling and trench excavation for electrical connections. A degree of noise generation will be unavoidable. The degree of noise, frequency of noise and individual perception are all important considerations when determining the impact on noise. Adequate warning of high noise events such as blasting (if required owing to the nature of the subsoil material) should be communicated to the affected communities prior to carrying out such activities. Construction times should be limited to normal working hours.

8.5.3 Worker Health and Safety

The impacts of construction can affect the health and safety of those working on the construction site and disturbance to the environment and animals. These impacts can be mitigated in the Environmental Management Programme (EMPr) and through adherence to the Occupational Health and Safety Act 85 of 1993.

An influx of workers is often characterised by higher health risks, particularly if the influx is male dominated. These include a higher disease burden and rise in HIV/AIDS rates. There is an increased risk associated with the gathering of construction workers in a concentrated area and the availability of disposable income which may attract prostitution. In this regard the World Bank (Gender in Agriculture Sourcebook, 2009, pp. 367-368) indicates that there is a strong link between infrastructure projects and health as:

“Transport, mobility, and gender inequality increase the spread of HIV and AIDS, which along with other infectious diseases, follow transport and construction workers on transport networks and other infrastructure into rural areas, causing serious economic impacts.”

It is expected that this influx will be limited owing to the large pool of potential workers for the project being available in Mangaung. The fact that the city is close to the construction site will obviate the need for communal living conditions that may increase the chances for the spread of disease.

There should also be awareness and education campaigns on health and social risks such as HIV/AIDS, COVID-19 and crime prevention.

Given that the project will employ females are part of the workforce, gender considerations should enjoy priority. The workplace should be free of harassment and employment practises should be transparent and free from any coercion or trading. The workplace should make adequate provision for separate gender changing areas and ablution facilities.

8.5.4 Security

There are safety concerns related to the construction activity. Landowners adjacent to similar projects, generally express security concerns, including an increase in crime rates once an area experiences an increase in population owing to the number of construction workers on site.

Mitigation measures include the project proponent, prior to construction, planning for the management of workers by taking measures such as readily identifiable clothing, having the site fenced and secured and taking measures to ensure workers do not congregate outside the site before or after working hours. A security policy must be drafted and strictly enforced by the contractors.

As a result of the analysis above, the following impact/mitigation table (Table 14) has been generated.

Table 14: Construction Phase Impact/Mitigation Table

Environmental Feature	Economic opportunities arising from the construction phase
Project life-cycle	Construction phase
Potential Impact	Proposed Management Objectives / Mitigation Measures
SMME Participation	<ul style="list-style-type: none"> Local SMMEs should be given an opportunity to participate in the construction of the project through the supply of services, material or equipment.
Job Creation and Skills Development	<ul style="list-style-type: none"> The main contractor should employ non-core labour from the regional study area as far as possible during the construction phase.
Indirect Employment Impacts	<ul style="list-style-type: none"> Spaza/informal trader shops may open next to the site because of construction. These should be controlled by the contractor to limit their footprint and to ensure that the MMM By-laws are complied with.

Environmental Feature		Economic opportunities arising from the construction phase				
Project life-cycle		Construction phase				
Potential Impact		Proposed Management Objectives / Mitigation Measures				
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Positive	Regional	Medium	Short Term	Likely	1
After Mitigation	Positive	Regional	Large	Short Term	Likely	3
Significance of Impact and Preferred Alternatives	Individuals who will benefit during the construction are limited to those who actively participate in the construction activity through employment, sub-contracting or other economic opportunities. Active participation should be encouraged. The benefits on such a construction will take place irrespective of which power line routing alternative is preferred.					

Environmental Feature		Disturbance arising from the construction phase				
Project life-cycle		Construction phase				
Potential Impact		Proposed Management Objectives / Mitigation Measures				
Increase in Dust		<ul style="list-style-type: none"> Dust and disturbance can be mitigated through the use of appropriate dust suppression mechanisms; Adherence to road signage can be added as an advantage and a measure to manage the increase in dust levels; Mitigation measures management should be adhered to according to the relevant specialist studies. 				
Influx of workers		<ul style="list-style-type: none"> All employment of locally sourced labour should be controlled and formalised. No employment should take place from the project gate and contracts of employment should be entered into taking into account the Labour Relations Act; If possible, and if the relevant Ward Councillors deems it necessary, the employment process should include the affected Ward Councillors and their ward committee. To limit the growth of informal settlements in the project area, labour should be sourced from existing labour sending areas, from people who resided in the area prior to appointment. This process should include the Ward Councillor to ensure that only local residents are employed, rather than labour migrants. No staff accommodation should be allowed on site; Influx of workers could may lead to increased diseases and HIV/AIDSs & STI as well as STD infections, therefore awareness programmes should be implemented through the local educational institutions and for the workers as well. 				
Worker Health and Safety		<ul style="list-style-type: none"> The provisions of the OHS Act 85 of 1993 and the Construction Regulations of 2014 should be implemented on all sites; Account should be taken of the safety impacts on the local community when carrying out the longitudinal aspects of the project, such as the powerline; Contractors should establish HIV/AIDS awareness programmes at their site camp. Gender sensitive workplace practises should be planned for and adopted on site. Employment practises should be demonstrated free of coercion or harassment. 				

Environmental Feature	Disturbance arising from the construction phase					
Project life-cycle	Construction phase					
Potential Impact	Proposed Management Objectives / Mitigation Measures					
Security	<ul style="list-style-type: none"> The camp site for the project and the longitudinal construction sub-site laid down areas should be fenced for the duration of construction; All contractors' staff should be easily identifiable through the wearing of uniforms; A project policy on management of workers should be developed. This would include education and awareness to be conducted with regards crime, trespassing and not gathering outside the site could be conducted. Security staff should only be allowed to reside at contractor camps and no other employees. 					
Noise impacts	<ul style="list-style-type: none"> Prior notice should be given to surrounding communities of noisy event such as blasting. Construction work should take place during working hours – defined as 07h00 to 17h00 on weekdays and 07h00 to 14h00 on Saturdays. Should overtime work be required, that will generate noise, consultation with the affected community or landowner should take place. 					
Damage to property	<ul style="list-style-type: none"> If a risk existing of damage taking place on a property as a result of construction, a condition survey should be undertaken prior to construction; The contractor is to make good and acknowledge any damage that occurs on any property as a result of construction work; Where crops and agricultural machinery are damaged, compensation is to be paid to the farmer for the proven loss of these crops; The farmer should be compensated for any loss of income experienced at the account of the contractor. 					
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Local	Medium	Short Term	Likely	2
After Mitigation	Negative	Local	Low	Short Term	Moderate	1
Significance of Impact and Preferred Alternatives	<p>Disturbances and irritation during construction is to be expected. These can then be successfully mitigated through contractor specifications that are issued at a tender stage and through the continuous monitoring of contractor proceedings and performance during construction phase.</p> <p>Negative impacts owing to the construction will unfortunately be experienced irrespective of the site and routing alternative that is most preferred and chosen.</p>					

8.6 Impacts on the Operational Phase.

8.6.1 Economic Impact

The positive economic and material well-being impacts associated with the project include:

- Support to the national grid through the generation of electricity;
- Stimulus to the national and regional study area in the form of spending associated with the project;
- Increase in employment opportunities; and
- Increased opportunities for SMMEs.

Jobs created during the operational phase of the project will be limited when compared to the construction phase, but 805 job years will be created directly by the project over its 20-year operational lifespan. In total it was estimated that 73 jobs in total will be created in this timeframe in the South African economy as a result of the project.

Economic opportunities will range from the supply of labour and skills to the project, supply of materials and equipment and an increase in wholesale and retail trade in the regional economy.

To ensure that economic activity derived from the project is localised as far as possible, measures should be adopted to increase local procurement of the human resources and procurement.

As a result of the analysis above, the following operational phase impact/mitigation table (Table 15) has been generated.

Table 15: Operational Phase Economic Impacts (Positive) Impact/Mitigation Table

Environmental Feature	Economic Impacts (positive)					
Project life-cycle	Operational Phase					
Potential Impact	Proposed Management Objectives / Mitigation Measures					
Economic	<ul style="list-style-type: none"> The solar park will stimulate the local economy through the provision of jobs and through local procurement. It will contribute to the improvement of the national electricity supply at a price that has been set by a competitive bidding process 					
Local Procurement	<ul style="list-style-type: none"> Local SMMEs should be given an opportunity to participate in the operation of the project through the supply of services, material or equipment. 					
	<ul style="list-style-type: none"> A procurement policy promoting the use of local business where possible, should be put in place and applied throughout the operational phases of the project. 					
Job Creation and Skills Development	<ul style="list-style-type: none"> Women should be given equal employment opportunities and encouraged to apply for positions. 					
	<ul style="list-style-type: none"> A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills whilst in employment. 					
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Positive	Regional	High	Long Term	Likely	3
After Mitigation	Positive	Regional	High	Long Term	Likely	3
Significance of Impact and Preferred Alternatives	<p>The solar park in the regional study area will provide economic stimulus to the regional study area for the long-term. The solar park should adopt policies that are supportive of local procurement and support for local enterprises.</p> <p>Economic impact considerations require that the most cost-effective transmission power line route be adopted to service the project.</p>					

8.6.2 Economic and material well-being (negative)

There are indirect impacts from the project that may have economic impact. Impacts in this class for the project are:

- Loss of productive agricultural land.

Loss of productive land

The implementation of the proposed project will have an impact on landowners in that land that would otherwise have been used for agriculture would now be re-purposed for use as a solar farm.

The authors view this as a low impact, given that the agricultural yield from the land in the area is very much lower than the yield from a solar park. The economic impact – both in terms of contribution of the Gross Value Added to the regional study area, and in terms of jobs created, of the land being used as a solar park will outweigh any possible agricultural use.

The results of the specialist studies related to agriculture will be relied upon when assessing this impact.

As a result of the analysis above, the following impact/mitigation table (Table 16) has been generated. It applies to the planning phase of the proposed project.

Table 16: Operational Phase Economic Well Being (Negative) Impact/Mitigation Table

Environmental Feature	Economic and material well-being (negative)					
Project life-cycle	Operational Phase					
Potential Impact	Proposed Management Objectives / Mitigation Measures					
Loss of productive land	<ul style="list-style-type: none"> • A very low impact that does not require mitigation. 					
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Local	Low	Short Term	Low	1
After Mitigation	Negative	Local	Low	Short Term	Low	1
Significance of Impact and Preferred Alternatives	This impact is not considered significant. It should be noted that this study defers to the agricultural specialists with regards the impact of the project on regional production.					

9 ANALYSIS OF ALTERNATIVES

An analysis of the project alternatives is carried out below.

9.1 No-Go Alternative

The No-Go alternative will present the following implications:

- There will be no contribution employment and skills development to the local community;
- The local economy will remain unchanged as the area, and will not attract new economic investment;

- The opportunity to improve the overall supply of electricity in the regional will be missed; and
- The economic stimulus presented by the project will be foregone.

There will be less economic development as there will be no opportunities for SMMES and local labourers. Having taken into consideration the project aims of electricity generation using renewable power sources and considering the assessment above which does not indicate any fatal socio-economic flaws, the benefits from the project going ahead, from a socio-economic perspective, will be larger than not proceeding. The “No-go” option is not supported by this study.

10 SITE SENSITIVITY VERIFICATION

The site sensitivity was verified by means of the methodology and findings of this report. There is no social theme for this project in the screening tool, hence this report conforms with the Environmental Impact Assessment regulations requirements.

The methodology establishes existing land use and includes motivation and evidence of such land use. The nature of this study and its impacts dictate that a larger study area than the immediate site and its adjoining properties be assessed. In this sense, the precise nature of the land development on the site is not relevant in this case.

11 IMPACT STATEMENT

An impact statement is required as per the NEMA regulations with regards to the proposed development.




The regional study area is a rural economy with a narrow base. The project site has few social receptors surrounding the site, and the project has a low footprint on the social environment. The social and economic impacts of the project are expected to be mainly positive in the sense that the local economy will be stimulated and broadened. The negative impacts are limited in nature and scope and can be successfully mitigated by management rules and practises. It is therefore found that the project, once the recommended mitigation measures have been implemented, has a nett positive impact on the social environment of the regional study area.




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APPENDIX 1: CENSUS OF PROJECT IMPACTS

Name	Coordinates	Image
SAJWV Olienhout Skietbaan Shooting range	26°58'05.38" S 27°30'47.81" E	 <p>A satellite image from Google Earth showing a landscape with a pink boundary line. A road or path runs diagonally across the scene. The terrain is a mix of brown and green, with some structures visible in the distance.</p>
Mining Entrance along R723	26°58'30.47" S 27°31'00.39" E	 <p>A satellite image from Google Earth showing a landscape with a pink boundary line. A road or path runs diagonally across the scene. The terrain is a mix of brown and green, with some structures visible in the distance.</p>
Natural Water Catchment area next to Parys Pigeon farm.	26°59'10.32" S 27°31'19.65" E	 <p>A satellite image from Google Earth showing a landscape with a road running vertically. A small, light-colored structure is visible on the left side of the road. The terrain is mostly brown and grey.</p>

Name	Coordinates	Image
Parys Pigeon Farm	26°59'24.66" S 27°31'12.81" E	
Vredefort Dome_ Old Police Station	26°59'50.01" S 27°30'03.69" E	
Farm residentials 1	27°00'07.33" S 27°29'32.36" E	

Name	Coordinates	Image
Manmade water catchment area	27°00'15.87" S 27°29'50.03" E	
Farm Residentials 2	27°00'06.56" S 27°29'32.96" E	
Farm residential 3	27°00'48.24" S 27°29'28.19" E	

Name	Coordinates	Image
Properties	27°00'21.87" S 27°29'02.55" E	
Farm residential 4	27°00'16.96" S 27°28'50.68" E	
Farm Properties 2	26°58'27.27" S 27°27'23.35" E	
Farm structures + natural water catchment area.	26°57'53.75" S 27°27'52.01" E	

Name	Coordinates	Image
<p>Schonkenville, Parys, there is also a church called Nederdiutse Gereformeerde Kerk along Thompson Road/R723</p>	<p>26°57'53.75" S 27°27'52.01" E</p>	
<p>Tumahole Suburb Parys</p>	<p>26°55'35.73" S 27°28'52.28" E</p>	
<p>Farm Structures</p>	<p>26°57'02.91" S 27°30'28.71" E</p>	