POFADDER WIND ENERGY FACILITY 2

Northern Cape Province

Social Impact Assessment

July 2022

savannah environmental

t +27 (0)11 656 3237
f +27 (0)86 684 0547
e info@savannahsa.com
w www.savannahsa.com

Prepared for:

Pofadder Wind Facility 2 (Pty) Ltd
Unit 1501 15th floor Portside Build
4 Bree Street
Cape Town
Western Cape
8001

savannah environmental

t +27 (0)11 656 3237 f +27 (0)86 684 0547 e info@savannahsa.com w www.savannahsa.com
First Floor, Block 2, 5 Woodlands Drive Office Park, Cnr Woodlands Drive & Western Service Road, Woodmead, 2191

REPORT DETAILS

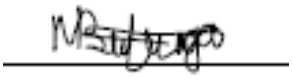
Title	:	Social Impact Assessment Report: Pofadder Wind Energy Facility 2
Authors	:	Savannah Environmental (Pty) Ltd Nondumiso Bulunga
External Reviewer	:	Tony Barbour
Client	:	Pofadder Wind Facility 2 (Pty) Ltd
Report Revision	:	Revision 1
Date	:	July 2022

When used as a reference this report should be cited as: Savannah Environmental (2022) Social Impact Assessment for Pofadder Wind Facility 2, Northern Cape.

SPECIALIST DECLARATION OF INTEREST

I, Nondumiso Bulunga, declare that –

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



Nondumiso Bulunga
Name

Signature

29 July 2022
Date

TABLE OF CONTENTS

FIGURES

TABLES

ACRONYMS

B-BBEE	Broad-Based Black Economic Empowerment
CLO	Community Liaison Officer
DEDECT	Department of Economic Development, Environment and Tourism
DFFE	Department of Forestry Fisheries and the Environment
DoE	Department of Mineral Resources and Energy
DM	District Municipality
EA	Environmental Authorisation
EAP	Economically Active Population
ECA	Environment Conservation Act (No. 73 of 1989)
ECO	Environmental Control Officer
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPC	Engineering, Procurement and Construction
GDP	Gross Domestic Product
GDP-R	Gross Domestic Product per Region
GGP	Gross Geographic Product
GHG	Greenhous Gas
GNP	Gross National Product
GNR	Government Notice
HDI	Historically Disadvantaged Individuals
I&AP	Interested and Affected Party
IDC	Industrial Development Corporation
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
IFC	International Finance Corporation
IRP	Integrated Resource Plan
KGLM	Kai !Garib Local Municipality
km	Kilometre
kV	Kilovolt
LED	Local Economic Development
LM	Local Municipality
NEMA	National Environmental Management Act (No. 107 of 1998)
NDP	National Development Plan
PGDS	Provincial Growth and Development Strategy
PICC	Presidential Infrastructure Coordinating Committee
PSDF	Provincial Spatial Development Framework
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SIP	Strategic Infrastructure Project
ZFDM	ZF Mgcawu District Municipality

1. INTRODUCTION AND PROJECT DESCRIPTION

The applicant Pofadder Wind Facility 2 (Pty) Ltd is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure on a site located approximately 20 km South East of Pofadder within the Kai !Garib Local Municipality and the ZF Mgcawu District Municipality in the Northern Cape Province.

Two additional WEF's are concurrently being considered on the properties and are assessed by way of separate impact assessment processes contained in the 2014 Environmental Impact Assessment (EIA) Regulations (GN No. R982, as amended) for listed activities contained Listing Notices 1, 2 and 3 (GN R983, R984 and R985, as amended). These projects are known as Pofadder Wind Facility 1 and Pofadder Wind Facility 3.

The development of the Wind Energy Facility and associated infrastructure requires Environmental Authorisation (EA) from the national Department of Forestry, Fisheries, and the Environment (DFFE) in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), and the EIA Regulations, 2014 (GNR 326), as amended, subject to the completion of an EIA process.

Nondumiso Bulunga of Savannah Environmental (Pty) Ltd has been appointed as the independent social impact assessment consultant responsible for undertaking a Social Impact Assessment as part of the EIA process being conducted for the project.

1.1. Project Description

A preferred project site with an extent of approximately 3 600 ha has been identified as a technically suitable area for the development of the Pofadder WEF 2, which will comprise of up to 28 turbines with a combined contracted capacity of up to 224 MW. The project site is located on the following properties:

- The Farm Ganna-Poort 202;
- The Farm Lovedale 201; and
- Portion 3 of the Farm Sand Gat 150.

Two additional WEF's are concurrently being considered on the properties and are assessed by way of separate impact assessment processes contained in the 2014 EIA Regulations (GN No. R982, as amended) for listed activities contained Listing Notices 1, 2 and 3 (GN R983, R984 and R985, as amended). These projects are known as Pofadder Wind Facility 1 and Pofadder Wind Facility 3.

The Pofadder WEF 2 project site is proposed to accommodate the following infrastructure, which will enable the wind farm to supply a contracted capacity of up to 224 MW:

- Up to 28 wind turbines with a maximum hub height of up to 200 m;
- A transformer at the base of each turbine;
- Concrete turbine foundations and turbine hardstands;
- Temporary laydown areas which will accommodate the boom erection, storage and assembly area;
- Medium Voltage Cabling between the turbines, to be laid underground where practical;
- An on-site substation of up to 1.6 ha in extent to facilitate the connection between the wind farm and the electricity grid;

- Access roads to the site and between project components inclusive of stormwater infrastructure. A 12 m road corridor may be temporary impacted during construction and rehabilitated to 6m wide after construction;
- Each turbine will have a circular foundation with a diameter of up to 32 m and this will be placed alongside the 45 m wide hardstand resulting in an area of about 45 m x 32 m that will be permanently disturbed for the turbine foundation. The combined permanent footprint for the turbines will be approximately 4.2 ha.
- Each turbine will have a crane hardstand of approximately 70 m x 45 m. The permanent footprint for turbine crane hardstands will be approximately 9 ha.
- Each turbine will have a blade hardstand of approximately 80 m x 45 m (3 600 m2). The combined permanent footprint for blade hardstands will be approximately 10ha.
- One (1) construction laydown / staging area of up to approximately 7ha (to be rehabilitated following construction). It should be noted that no on-site labour camps will be required in order to house workers overnight as all workers will be accommodated in the nearby towns, and transported daily to site (by bus);
- The gate house and security house will occupy an area of up to 0.5ha.
- Pofadder WEF 2 will have a total road network of about 48 km.
- Battery Energy Storage System (BESS) of approx. 3.6ha;
- A temporary concrete batching plant; and
- Operation and Maintenance buildings including a gate house, security building, control centre, offices, warehouses, a workshop and visitors centre.

In order to evacuate the energy generated by the WEF's to supplement the national grid, Pofadder Grid (Pty) Ltd is proposing grid connection alternatives which will be assessed in a separate Integrated Grid Basic Assessment Report.

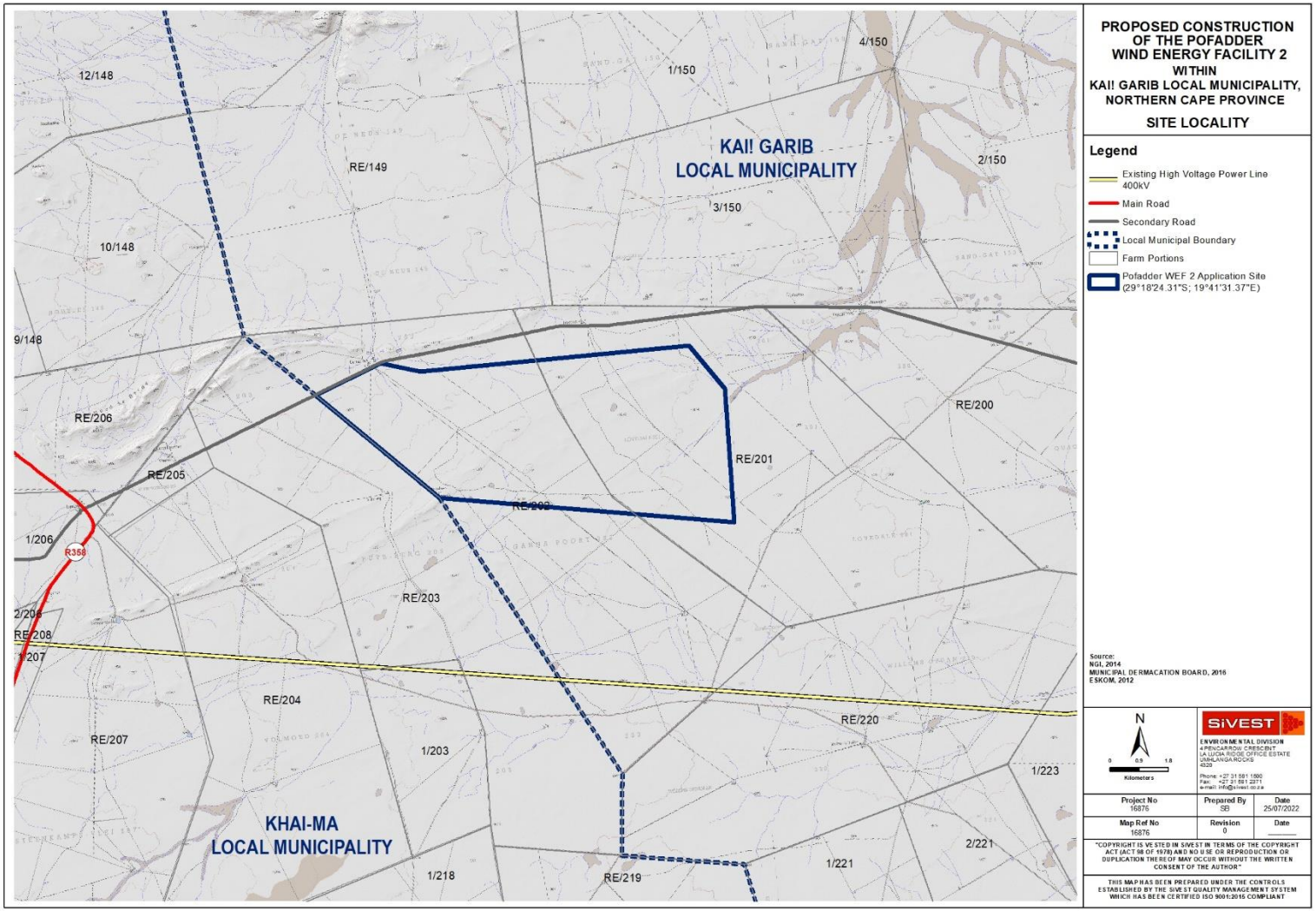


Figure 1-1: Locality map illustrating of the Pofadder Wind facility 2 development areas.

1.2. Details of the Independent Specialist

This SIA Report has been undertaken by Nondumiso Bulunga of Savannah Environmental.

» **Nondumiso Bulunga** – holds a master's degree in advanced Geographical Information System and has eight years of experience in the environmental field. Her key focus is on environmental and social impact assessments, public participation, stakeholder engagement environmental management screening as well as mapping using ArcGIS for a variety of environmental projects.

» **Tony Barbour** has as 30 years' experience in the environmental consulting sector. His experience includes ten years as an environmental consultant in the private sector in South Africa followed by four and a half years at the University of Cape Town's Environmental Evaluation Unit.

Tony Barbour's has undertaken an external review of this SIA and has provided an external reviewer's letter. This letter is attached as **Appendix B.**

1.3. Structure of the SIA Report

This SIA Report has been prepared in accordance with the requirements of Appendix 6 of the 2014 EIA Regulations, as amended. An overview of the contents of this SIA Report, as prescribed by Appendix 6 of the 2014 EIA Regulations (GNR 326), and where the corresponding information can be found within the report is provided in **Table 1-1**.

Table 1-1: Summary of where the requirements of Appendix 6 of the 2014 NEMA EIA Regulations (GNR 326), as amended, are provided within this Specialist Report.

Requirement		Location in Report
(a)	Details of – (i) The specialist who prepared the report. (ii) The expertise of that specialist to compile a specialist report including a curriculum vitae.	Section 1
(b)	A declaration that the specialist is independent in a form as may be specified by the competent authority.	Specialist Declaration of Interest
(c)	An indication of the scope of, and the purpose for which, the report was prepared.	Section 2
(cA)	An indication of the quality and age of base data used for the specialist report.	Section 4
(cB)	A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change.	Section 0
(d)	The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment.	Section 2
(e)	A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used.	Section 2
(f)	Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives.	Section 4 Section 0
(g)	An identification of any areas to be avoided, including buffers.	N/A
(h)	A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	N/A
(i)	A description of any assumptions made and any uncertainties or gaps in knowledge.	Section 2

Requirement		Location in Report
(j)	A description of the findings and potential implications of such findings on the impact of the proposed activity or activities.	Section 0
(k)	Any mitigation measures for inclusion in the EMPr.	Appendix A
(l)	Any conditions for inclusion in the environmental authorisation.	Section 6
(m)	Any monitoring requirements for inclusion in the EMPr or environmental authorisation.	Appendix A
(n)	A reasoned opinion – (i) Whether the proposed activity, activities or portions thereof should be authorised. (iA) Regarding the acceptability of the proposed activity or activities. (ii) If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures.	Section 6
(o)	A description of any consultation process that was undertaken during the course of preparing the specialist report.	Section 2
(p)	A summary and copies of any comments received during any consultation process and where applicable all responses thereto.	N/A
(q)	Any other information requested by the competent authority.	N/A
2.	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

2. METHODOLOGY AND APPROACH

2.1. Purpose of the Study

The International Principles for Social Impact Assessment define SIA as:

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

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

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

The purpose of this SIA Process is therefore to:

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

2.2. Approach to the Study

This SIA Report provides a snapshot of the current social setting within which the Pofadder WEF 2 is proposed. It provides an overview of the manner and degree to which the current status quo is likely to change or be impacted by the construction, operation and decommissioning of the project, as well as the way the social environment is likely to impact on the development itself.

An overview of the assessment methodology utilised as part of this SIA is provided below:

The SIA process comprised the following:

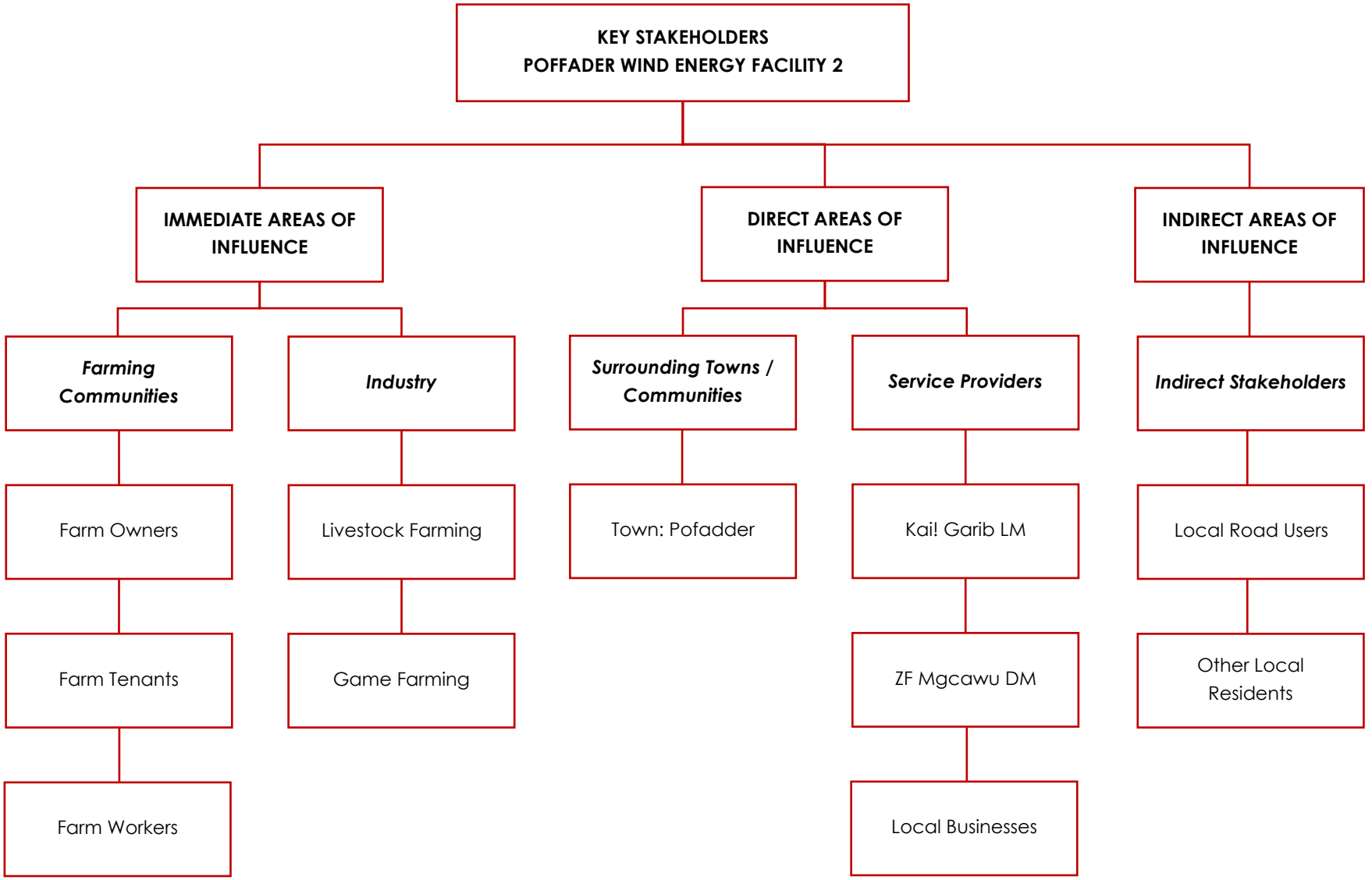
» Collection and review of existing information, including national, provincial, district, and local plans, policies, programmes, census data, and available literature from previous studies conducted within the area. Project specific information was obtained from the project proponent.
» Identification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

2.2.1. Stakeholder Identification and Analysis

Stakeholders are defined as: "A*ny group or organisation which may affect or be affected by the issue under consideration*" (UN, 2001: 26).

These may be directly or indirectly impacted and may include organisations, institutions, groups of people or individuals, and can be at any level or position in society, from the international to regional, national, or household level (Franke & Guidero, 2012).

Stakeholder analysis involves the identification of affected or impacted people and their key grouping and sub-groupings (IFC, 2007). Identifying stakeholders that are directly and indirectly affected by the project is important to determine who might be impacted by the development and in what way. The key stakeholders in the area proposed for development have been identified, grouped / sub-grouped and described (as per Ilse Aucamp SIA methodology and Aucamp et al, 2011). There are immediate, direct and indirect areas of influence to the proposed development. Affected stakeholders comprise sensitive social receptors that may potentially be affected by the proposed development based on their location.


KEY STAKEHOLDERS
POFFADER WIND ENERGY FACILITY 2
IMMEDIATE AREAS OF INFLUENCE
DIRECT AREAS OF INFLUENCE
INDIRECT AREAS OF INFLUENCE
Farming Communities
Industry
Surrounding Towns / Communities
Service Providers
Indirect Stakeholders
Farm Owners
Livestock Farming
Town: Pofadder
Kai! Garib LM
Local Road Users
Farm Tenants
Game Farming
ZF Mgcawu DM
Other Local Residents
Farm Workers
Local Businesses

A description of each of the stakeholders' groups in relation to the proposed Wind Energy Facility and associated infrastructure is discussed in detail below:

- **Farming community:** The farming community can be grouped into three categories, namely farm owners, farm tenants, and farm workers. Farm owners comprise individuals who own and make a living off of their properties. Farm tenants are people who rent land and work on the land to earn an income. Farm workers are people who work, and also often reside on the farm with their families and are seen as a vulnerable community.
- **Farming industry:** There are potentially vulnerable farming activities in the broader study area of the project. Agriculture is one of the main economic activities within the area, and the primary agricultural activities comprise mainly livestock farming.
- **Surrounding towns / affected communities:** One town is in proximity to Pofadder WEF 2, which is Pofadder. The proposed development site is located southeast of Pofadder. The town of Pofadder, although one of the main towns in the Kai !Garib Local Municipality is a small town situated on the N14 national road from Upington to Springbok. It also lies within 50km from the Namibian border. This town is therefore generally considered as a stop-over town for travelling tourists.
- **Service providers:** The major service providers which will be affected by the project include the DM, LM, and local businesses in the area. The Kai !Garib LM and to a lesser degree the ZF Mgcawu DM are likely to be impacted by the proposed development. The Kai !Garib LM will absorb a number of positive and negative social impacts. In addition, there are a number of local businesses in the surrounding area that could be impacted negatively or benefit from the opportunities of the proposed project.
- **Stakeholders outside the direct area of influence:** There are a number of stakeholders that reside outside the direct area of influence but who may be affected by the project. These include road users, including those that use the local gravel roads on a frequent basis as part of their daily or weekly movement patterns.

2.2.2. Collection and Review of Existing Information

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

- Project maps and layouts.
- Google Earth imagery.
- A description of the project (as provided by the project proponent).
- Responses to questions posed to the project proponent regarding employment and social upliftment and local economic development opportunities (as provided by the project proponent).
- Census Data (2011), and the Local Government Handbook (2019).
- Planning documentation such as Provincial Growth and Development Strategies (PGDSs), Local and District Municipality Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs), and development goals and objectives.
- Relevant legislation, guidelines, policies, plans, and frameworks.
- Available literature pertaining to social issues associated with the development and operation of Wind Energy facility and associated infrastructure.

2.2.3. Key consideration/impacts for wind energy facilities

This section of the social impact report provides a brief overview of the different components associated with a wind turbine generator. The main components included in a wind turbine according to Manwell *et al*, (2002:283) are, the rotor, the drive train, the main frame, the yaw system; and the tower.

Wind turbines use the energy from the wind to generate electricity. A wind turbine consists of four large main components (**Figure 2-1**):

» The rotor
» The nacelle
» The tower
» The foundation unit

The mechanical power generated by the rotation of the blades is transmitted to the generator within the nacelle via a gearbox and drive train. The wind turns the blades, which in turn spin a shaft which connects to a generator and generates electricity. The use of wind for electricity generation is essentially a non-consumptive use of a natural resource and produces zero greenhouse gas emissions.

Turbines can operate at varying speeds. The amount of energy a turbine can harness depends on both the wind velocity and the length of the rotor blades. The turbines being considered for use at the wind farm of up to 200MW in capacity.

Various wind turbine designs and layouts on the project sites are being considered by the project developer in order to maximise the generating capacity of the sites while minimising environmental impacts. The final facility layouts, turbine capacities and models will be dependent on what is deemed suitable for the project sites in relation to, among other things, further studies of the wind regime, terrain, and environmental constraints and social sensitivities.

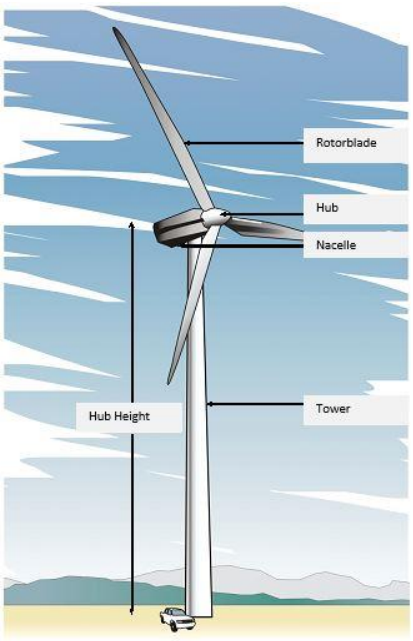


Figure 2-1 Main components of a wind turbine

The length of the construction period for each of the wind farms is estimated to be approximately 30 months. A turbine is designed to operate continuously, with low maintenance for 20 to 25 years.

2.3. Approach to identification of potential impacts

According to Vanclay's list of social impact variable there are various social impact variables that need to be considered across the project and need to be clustered under the flowing main categories:

1. Health and social well-being
2. Quality of the living environment (liveability)
3. Economic
4. Cultural

According to Hamed & Alshare, 2021 it is important to note the multi – and interdisciplinary nature towards a better understanding and management of the environmental effects of certain renewable energy installations.

2.3.1. Health and social wellbeing

The health and social wellbeing impacts related to the project include air quality, noise, shadow flicker, blade glint, electromagnetic field and RF interference, increase in crime, increased risk of HIV infections, influx of construction workers and hazard exposure. Each of these impacts are addressed separately below.

Regarding **air quality**, construction activities are likely to result in the generation of dust and exhaust emissions. Although air quality is subject to a separate specialist study, it should be noted as a factor that may have health consequences.

With the impacts on **noise,** the operation of the wind turbines has the potential to result in the generation of noise levels that could have nuisance and health impacts for surrounding communities (Michaud, et al., 2016).

Potential impacts from **shadow flicker** which could be experienced during the operation phase could result in the blades momentarily casting shadows that create a strobe effect which can be seen as annoying and regarded a health hazard by some people. Whilst **blade glint** referring to light reflected off the turbine blades that may result in a flickering sensation which can affect residents in their homes and distract motorists travelling along nearby roads such as the N14.

Electromagnetic fields (EMF's) and radio frequency interference (RFI) have been associated with grid connection power lines and wind turbine generators; although the exact extent of this risk remains unclear according to Krogh & Harrington, 2019.

The issues around **crime** will mostly form part of the construction phase if at all. It is often opportunistic crime, stock theft, abuse of alcohol and relationship related crime that is associated with construction activities. Considering the relative remoteness of the project it is unlikely that the project will lead to any significant increase in crime levels in the area, however, it would be pertinent for the developers to ensure that processes are put in place through which any suspected criminal activities associated with the project can be easily communicated and swiftly addressed.

The increased risk of **HIV infections** is likely to be at its highest during the construction phase of the project as the construction workforce increases and material and equipment is delivered to the site and it is likely to subside during the operational phase. It is important that this issue be given serious attention and that the mitigation measures are implemented, and that the situation is closely monitored throughout the construction and operational phases of the project.

The **influx of workers** has a possibility of leading to the disruption of social networks with the formation of temporary relationships and an increase in pregnancy which may place pressures on local family units. The arrival of construction workers may result in a formation of a subculture that could manifest in antisocial behaviour, which conflicts with expectations of local communities. This could be as a result of the community accustomed to being quiet, rural environment, becoming dissatisfied with the neighbourhood.

Aylin, Colak & Dagdeviren, 2018, reported that the highest risks associated with wind energy facilities occur during transportation and construction. Over the construction period, the use of heavy equipment and vehicles and an increase in vehicle traffic along the N14 and within the vicinity of all construction sites will result in increased risk to the personal safety of people and animals. Excavation work and trenches also pose a hazard to the safety of people, particularly children and animals.

2.3.2. Quality of living environment

There are three components that need to be observed as part of the investigation for the quality of life:

1. Disruption of daily living patterns
2. Disruptions to social and community infrastructure
3. Transformation of the sense of place

If there are any **disruptions to daily living patterns**, these are minimal and are likely to take place during the construction phase. This impact will be associated with the site and the main access roads. With **disruption to social and community infrastructure** impacts the are most likely to occur during the construction phase. In addition, considering the cumulative basis, the activities taking place in, and being planned for the area, it is unlikely there would be a significant impact in this regard. The wind energy facility will be highly visible and will result in the **landscape being transformed** from that of a rural setting to what would be considered by some to have more of an industrial aura. The visual environment and noise are both important elements through which a sense of place is constructed.

2.3.3. Economic

The economic impacts are related to the following:

1. Job creation and skills development
2. Socio-economic stimulation

The development of this project will **create both direct and indirect jobs** which will have a positive economic benefit within the region. Job opportunities will be available and many of the low and semi-skilled employment opportunities will probably be available to residents in the area. Many of the beneficiaries are likely to be historically disadvantaged members of the community and the project will provide opportunities to develop skills for the local people. Even more the project will stimulate the local economy, which is likely to be most significant at a cumulative level. The **socio-economic stimulation** will contribute

in the form of disposable salaries and the purchases of services and supplies from the local communities in and around the towns of Pofadder. The developer would need to ensure that there is a corporate social responsibility plan in place, the intention is ensure that it falls in line with the Renewable Energy Independent Power Producer Procurement (REIPPP) BID guidelines or to put an equivalent plan in place.

The **socio-economic values** associated with the proposed Pofadder WEF 2 are based on review of previously similar projects in the proposed area as well as similar projects in different areas of the country that have been conducted. The construction phase for similar WEF's like the Pofadder WEF 2 will extend over a period of 24 to 36 months (2-3 years). The total estimated wage bill for the construction phase is ±R 54 million, where total capital expenditure estimate for construction phase is ±R 2.4 billion. The construction phase will employ 300-400 employees. The number of employment opportunities in terms of low skilled, semi-skilled and skilled is Low skilled: ± 165 - 220 (± 55%); Semi-skilled: ± 90 - 120 (± 30%) and Skilled: ± 45 - 60 (± 15%).

The typical lifespan of WEFs is 20 to 25 years, during the operational phase there will be a significant decrease in employment opportunities, hence the potential socio-economic benefits will be limited. The total number of people employed in the operational phase is ± 40 – 50. Typical employees that might be required include Technicians, electricians, engineers, IT specialists, environmental specialists, health and safety managers, and administrators (skilled); drivers and equipment operators (semi-skilled); construction workers and security staff (low-skilled). It should be noted that the majority of the semi- and low-skilled employment opportunities are likely to be available to the local communities of Pofadder and Kakamas, which will present a positive social benefit to these communities due to the low availability of employment opportunities in these areas.

2.3.4. Cultural

At a social level, it is likely that any cultural impact would be associated with sensitive archaeological and/or heritage sites that may be found. In this regards, recommendation:

> *"The main heritage concerns for this project are archaeological sites and the cultural landscape. Some archaeological sites are within the current layout but none of these are highly significant sites and none require in situ conservation. It is, of course, always best to avoid any sites that have some research value and hence cultural significance, but excavation within a commercial mitigation context would be completely acceptable for all of the sites concerned here."*

2.4. Collection of Primary Data

Primary data was collected in the form of face-to-face interviews on Friday 1 April 2022 with the directly affected landowner, as well as telephonic interviews. The following is a summary of discussions held with the landowners directly affected by the project.

Table 2-1 Landowner consultation during the Environmental Impact Assessment Phase

Landowner	Representative details	Date of contact / attempted contact	Notes and feedback (not verbatim, only summarised)
Gerhard Visser	WEF Directly Affected Landowner Sand Gat 150 Portion 3	1st April 2022 Face-to-face	Safety and security are the biggest concern with this proposed development. I am currently farming

Landowner	Representative details	Date of contact / attempted contact	Notes and feedback (not verbatim, only summarised)
			sheep and afraid of theft on my livestock, it would be appreciated that this proposed development brings certainty on the safety and security aspects. The agreement that has been proposed is that during construction the sheep be moved for about 2 – 3 years, I would need compensation to happen to assist with this move. My suggestion is that since Eskom has a servitude the proposed development follows that same line. The roads may also need to be upgraded or rather useable for the transportation of the blades. This area has had issues with a drought and a lot of bushes have died over the years due to the drought issues. My suggestion is that fauna and flora is not removed/destroyed so there is some rehabilitation done and not severe damage experienced by the vegetation. On the conservation side specialists say the bats or eagles in the area are of concern, this can't really be a major concern in this area as there is a certain type of bird species (eagles) that come into this area only during heavy raining seasons. We have the Blue Cranes passing through this area 1 in 20 years bats are not the biggest issue.
Sonet van Zyl	Grid Corridor Landowner Houmoed Farm 206 Portion 1	1st April 2022 Face-to-face	No problem with the proposed development. The issues we have experienced on the farms is the drought which has made farming very difficult for us, this development may assist with some of the climate matters.
Willem Van Niekerk	WEF Directly Affected Landowner Lovedale 201 Portion 0	05 April 2022 Via Telephone	On a scale of 1-5 where 5 is most positive, I choose 5. This development comes at a time where it is important that green energy is incorporated into green energy mix.
Mr. Abrie van Niekerk	Grid Corridor Landowner Steenkamps Vlei 207 Portion 0 and 1 Van Titens Ville 208 Portion 0 Poortjie Farm 209 Portion 1	Attempts of telephonic interview were made 1 April 2022. The telephonic discussion was undertaken 4 April 2022.	Positive about the Wind Energy Facility in the area, and we really want the projects to get going. The gridline is on my property, and I am fine with the proposal. Projects like this are good for the surrounding communities, like an upgrade of a library etc. but nothing comes back to the "farmer

Landowner	Representative details	Date of contact / attempted contact	Notes and feedback (not verbatim, only summarised)
			communities" surrounding these projects. It would be appreciated if adjacent/affected landowners could at least get their roads scraped during the project or cameras for the safety of the landowner's families.
Mr. Wilhelm	Grid Corridor Landowner Poortjie Farm 209 Portion 0	Attempts of telephonic interview were made 1 April 2022. The telephonic discussion was undertaken 4 April 2022.	I have no issue with the project, and I am very excited for the project that will possibly be done on my farm. The sooner the project the better. We propose a solution for the fact that there is no signal in the area and ask if a telephone tower can be placed on the mountain so that the communication between employer and employees could be better.
Wynand	Grid Corridor Landowner Volmoed Farm 204 Portion 0	Attempts of telephonic interview were made 1 April 2022. The telephonic discussion was undertaken 6 April 2022.	I am aware of the project happening. I have no concerns, comments, or suggestions. I do not mind renewable energy projects and would not even mind if there is a project on his land.

During the interviews, interviewees were provided with background on the proposed project, and the EIA and public participation process being undertaken in support of the application for EA. Interviewees were then interviewed utilising a questionnaire to determine their perceptions, interest and concerns regarding the project.

Should any comments or concerns be raised from a social perspective regarding the project during the public participation process of the project, these will be included and addressed as part of the final SIA to be submitted to DFFE for decision-making.

2.5. Impact Assessment Evaluation Method

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the possible mitigation of the impact. Impacts have been consolidated into one (1) rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

Table 2-2 Rating of impacts criteria

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity (e.g. Surface Water).		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particularaction or activity (e.g. oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during thedetailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY (R)		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation

		measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES (L)		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION (D)		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effectswill last for the period of a relatively short construction period anda limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
INTENSITY / MAGNITUDE (I / M)		
Describes the severity of an impact (i.e. whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general

		integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation oftenimpossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.

SIGNIFICANCE (S)

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:

Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.

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

Points	Impact Significance Rating	Description
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level ofimpact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.

62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and areunlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.

2.6. Limitations and Assumptions

- Data derived from the 2011 Census, Northern Cape Provincial Growth and Development Strategy 2004-2014), Northern Cape Climate Change Response Strategy; Kai !Garib Local Municipality Integrated Development Plan; ZF Mgcawu District Municipality Integrated Development Plan (2017 – 2022 was used to generate most of the information provided in the baseline profile of the study area. The possibility therefore exists that the data utilised may be out of date and may not provide an accurate reflection of the current status quo.
- This SIA Report is intended to provide an overview of the current social environmental and assist in the identification of potential social impacts
- This SIA Report was prepared based on information which was available to the specialist at the time of preparing the report. The sources consulted are not exhaustive, and the possibility exists that additional information which might strengthen arguments, contradict information in this report, and / or identify additional information might exist.
- Some of the project projections reflected in this SIA Report (i.e., with regards to job creation and local content) may be subject to change, and therefore may be higher or lower than those estimated by the project proponent.
- It is assumed that the motivation for, and planning and feasibility study of the project were undertaken with integrity; and that information provided by the project proponent was accurate and true at the time of preparing this SIA Report.

3. LEGISLATION AND POLICY REVIEW

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

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

3.1. National Policy and Planning Context:

» Constitution of the Republic of South Africa, 1996
» National Environmental Management Act (No. 107 of 1998) (NEMA)
» White Paper on the Energy Policy of the Republic of South Africa (1998)
» National Energy Act (No. 34 of 2008)
» Integrated Energy Plan (IEP) (2016)
» National Development Plan (NDP) 2030 (2012)
» Integrated Resource Plan for Electricity (IRP) 2010 – 2030 (2011) (and subsequent updates thereto)
» Strategic Infrastructure Projects (SIPs)

3.2. Provincial Policy and Planning Context:

» Northern Cape Provincial Growth and Development Strategy (2004-2014)
» Northern Cape Province Twenty Year Review (2014)
» Northern Cape Spatial Development Framework (2012)
» Northern Cape Department of Environment & Nature Conservation Annual Report (2016/17)
» Northern Cape Department of Economic Development & Tourism Annual Report (2017)
» Northern Cape State of Province Address (2018)
» Northern Cape Climate Change Response Strategy

3.3. Local Policy and Planning Context:

» ZF Mgcawu District Municipality Integrated Development Plan (IDP) (2017 – 2022)
» Kai !Garib Local Municipality Integrated Development Plan (IDP) (2021 -2022)

3.4. National Policy and Planning Context

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

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

Table 3.1: Relevant national legislation and policies for the Pofadder WEF 2

Relevant legislation or policy	Relevance to the proposed project
Constitution of the Republic of South Africa, 1996	Section 24 of the Constitution pertains specifically to the environment. It states that Everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to environmental impacts.
National Environmental Management Act (No. 107 of 1998) (NEMA)	This piece of legislation is South Africa's key piece of environmental legislation and sets the framework for environmental management in South Africa. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights. The national environmental management principles state that the social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment. The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.
White Paper on the Energy Policy of the Republic of South Africa (1998)	The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa's energy security. This can be achieved through increased use of RE and encouraging new entries into the generation market. South Africa has an attractive range of cost-effective renewable resources, taking into consideration social and environmental costs. Government policy RE is thus concerned with meeting the following challenges: » Ensuring that economically feasible technologies and applications are implemented. » Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options. » Addressing constraints on the development of the renewable industry. The policy states that the advantages of RE include minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include higher capital costs in some cases; lower energy densities; and lower levels of availability, depending on specific conditions, especially with sun and wind-based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future. The White Paper on Energy Policy therefore supports the advancement of RE sources and ensuring energy security through the diversification of supply.
National Energy Act (No.34 of 2008)	The purpose of the National Energy Act (No. 34 of 2008) is to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, while taking environmental

Relevant legislation or policy	Relevance to the proposed project
	management requirements into account. In addition, the Act also provides for energy planning, and increased generation and consumption of Renewable Energies (REs). The objectives of the Act, are to amongst other things, to: » Ensure uninterrupted supply of energy to the Republic. » Promote diversity of supply of energy and its sources. » Facilitate energy access for improvement of the quality of life of the people of the Republic. » Contribute to the sustainable development of South Africa's economy. The National Energy Act therefore recognises the significant role which electricity plays growing the economy while improving citizens' quality of life. The Act provides the legal framework which supports the development of RE facilities for the greater environmental and social good and provides the backdrop against which South Africa's strategic planning regarding future electricity provision and supply takes place. It also provides the legal framework which supports the development of RE facilities for the greater environmental and social good.
Integrated Energy Plan (IEP) (2016)	The Integrated Energy Plan (IEP) (which was developed under the National Energy Act (No. 34 of 2008)), recognises that energy is essential to many human activities, and is critical to the social and economic development of a country. The purpose of the IEP is essentially to ensure the availability of energy resources, and access to energy services in an affordable and sustainable manner, while minimising associated adverse environmental impacts. Energy planning therefore needs to balance the need for continued economic growth with social needs, and the need to protect the natural environment. The IEP is a multi-faceted, long-term energy framework which has multiple aims, some of which include: » To guide the development of energy policies and, where relevant, set the framework for regulations in the energy sector. » To guide the selection of appropriate technologies to meet energy demand (i.e., the types and sizes of new power plants and refineries to be built and the prices that should be charged for fuels). » To guide investment in and the development of energy infrastructure in South Africa. » To propose alternative energy strategies which are informed by testing the potential impacts of various factors such as proposed policies, introduction of new technologies, and effects of exogenous macro- economic factors.
National Development Plan 2030 (2012)	The National Development Plan (NDP) 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030. In terms of the Energy Sector's role in empowering South Africa, the NDP envisages that, by 2030, South Africa will have an energy sector that promotes: » Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. » Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.

Relevant legislation or policy	Relevance to the proposed project
	» Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. The NDP aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The development of the grid connection infrastructure is considered to be relevant to the plan due to the need of the infrastructure for economic growth within the Kai !Garib Local Municipality municipal area.
Integrated Resource Plan for Electricity (IRP) 2010-2030 (2011) and subsequent updates	The Integrated Resource Plan for Electricity (IRP) 2010 – 2030 is a subset of the IEP and constitutes South Africa's national electricity plan. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation. The current iteration of the IRP, led to the Revised Balanced Scenario (RBS) that was published in October 2010. Following a round of public participation which was conducted in November / December 2010, several changes were made to the IRP model assumptions. The document outlines the proposed generation new-build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on a cost- optimal solution for new-build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation. The Policy-Adjusted IRP reflects recent developments with respect to prices for renewables. In addition to all existing and committed power plants, the plan includes 9.6GW of nuclear; 6.25GW of coal; 17.8GW of renewables; and approximately 8.9GW of other generation sources such as hydro, and gas.
Strategic Infrastructure Projects (SIPs)	The Presidential Infrastructure Coordinating Committee (PICC) are integrating and phasing investment plans across 18 Strategic Infrastructure Projects (SIPs) which have the following 5 core functions: » To unlock opportunity. » Transform the economic landscape. » Create new jobs. » Strengthen the delivery of basic services. » Support the integration of African economies. A balanced approach is being fostered through greening of the economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development, and enabling regional integration. SIP 8 of the energy SIPs supports the development of RE projects as follow: » SIP 8: Green energy in support of the South African economy: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010) and supports bio-fuel production facilities.

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

3.5. Provincial Policies

This section provides a brief review of the most relevant provincial policies. The Pofadder WEF 2 and associated infrastructure is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

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

Table 3.2: Relevant provincial policies for the Pofadder WEF 2

Relevant policy	Relevance to the proposed project
Northern Cape Provincial Growth and Development Strategy (2004 - 2014)	The Northern Cape Provincial Growth and Development Strategy (NCPGDS) identifies poverty reduction as the most significant challenges facing the government and its partners. All other societal challenges that the province faces emanate predominately from the effects of poverty. The NCPGDS notes that the only effective way to reduce poverty is through long-term sustainable economic growth and development, The sectors where economic growth and development can be promoted include: » Agriculture and Agro-processing; » Fishing and Mariculture » Mining and mineral processing » Transport » Manufacturing » Tourism However, the NCPGDS also notes that economic development in these sectors also requires: » Creating opportunities for lifelong learning » Improving the skills of the labour force to increase productivity » Increasing accessibility to knowledge and information The achievement of these primary development objectives depends on the achievement of a number of related objectives that, at a macro-level, describe necessary conditions for growth and development. These are: » Developing requisite levels of human and social capital » Improving the efficiency and effectiveness of governance and other development institutions » Enhancing infrastructure for economic growth and social development Of specific relevance to the SIA the NCPGDS refers to the need to ensure the availability of inexpensive energy. The section notes that to promote economic growth in the Northern Cape the availability of electricity to key industrial users at critical localities at rates that enhance the competitiveness of their industries must be ensured, At the same time, the development of new sources of energy through the promotion of the adoption of energy applications that display a synergy with the province's natural resource endowments must be encouraged. In this regard the NCPGDS notes "the development of energy sources such as solar energy, the natural gas fields, bio-fuels etc., could be some of the means by which new economic opportunity and activity is generated in the Northern Cape". The NCPGDS also highlights the importance of close co-operation between the public and private sectors for the economic development potential of the Northern Cape to be realised.

Relevant policy	Relevance to the proposed project
	The NCPGDS also highlights the importance of enterprise development, and notes that the current levels of private sector development and investment in the Northern Cape are low. In addition, the province also lags in the key policy priority areas of SMME Development and Black Economic Empowerment. The proposed solar energy facility therefore has the potential to create opportunities to promote private sector investment and the development of SMMEs in the Northern Cape Province. In this regard care will need to be taken to ensure that the proposed STPs and other renewable energy facilities do not negatively impact on the regions natural environment, in this regard the NCPGDS notes that the sustainable utilisation of the natural base on which agriculture depends is critical in the Northern Cape with its fragile eco-systems and vulnerability to climatic variation. The document also indicates that due to the provinces exceptional natural and cultural attributes, it has the potential to become the preferred adventure and ecotourism destination in South Africa. Care therefore needs to be undertaken to ensure that the development of large renewable energy project, such as the proposed solar energy facility, do not affect the tourism potential of the province.
Northern Cape Provincial Spatial Development Framework	Northern Cape Provincial Spatial Development Framework (NCSDF) (2012) lists a number of sectoral strategies and plans are to be read and treated as key components of the PSDF. Of these there are a number that are relevant to the proposed STPs. These includes: **Sectoral Strategy 1**: Provincial Growth and Development Strategy of the Provincial Government; **Sectoral Strategy 2**: Comprehensive Growth and Development Programme of the Department of Agriculture, Land Reform and Rural Development **Sectoral Strategy 5**: Local Economic Development (LED) Strategy of the Department of Economic Development and Tourism **Sectoral Strategy 11**: Small Micro Medium Enterprises (SMME) Development Strategy of the Department of Economic Development and Tourism; **Sectoral Strategy 12**: Tourism Strategy of the Department of Economic Development and Tourism **Sectoral Strategy 19**: Provincial renewable energy strategy (to be facilitated by the Department of Economic Development and Tourism) Under Section B14.4, Energy Sector the NCSDF (2012), notes the total area of high radiation in South Africa amounts to approximately 194 000 km² of which the majority falls within the Northern Cape. It is estimated that, if the electricity production per km² of mirror surface in a solar thermal power station were 30.2 MW and only 1% of the area of high radiation were available for solar power generation, the generation potential would equate to approximately 64 GW. A mere 1.25% of the area of high radiation could thus meet projected South African electricity demand in 2025 (80 MW) (NCPSDF, 2012). However, the SDF does indicate that this would require large investments in transmission lines from the areas of high radiation to the main electricity consumer centres. The SDF also notes that the implementation of large concentrating solar power (CSP) plants has been proposed as one of the main contributors to greenhouse gas emission reductions in South Africa. In this regard various solar parks and CSP plants have been proposed in the province with Upington being the hub of such developments (NCPSDF,2012). Section C8.23, Energy Objectives, set out the energy objectives for the Northern Cape Province. The section makes specific reference to renewable energy, The objectives are listed below. » Promote the development of renewable energy supply schemes. Large-scale renewable energy supply schemes are strategically important for increasing the

Relevant policy	Relevance to the proposed project
	diversity of domestic energy supplies and avoiding energy imports while minimizing detrimental environmental impacts » Enhance the efficiency of Eskom's power station at the Vanderkloof power station » To reinforce the existing transmission network and to ensure a reliable electricity supply in the Northern Cape, construct a 400 IV transmission power line from Ferrum Substation (near Kathu/Sishen) to Garona Substation (near Groblershoop). There is a national electricity supply shortage and the country is now in a position where it needs to commission additional plants urgently. Consequently, renewable energy project is a high priority » Develop and institute innovative new energy technologies to improve access to reliable, sustainable and affordable energy services with the objectives to realize sustainable economic growth and development. The goals of service in supplying and providing energy services, tackling climate change, avoiding air pollution and reaching sustainable development in the province offer both opportunities and synergies which require joint planning between local and provincial government as well as the private sector » Develop and institute energy supply schemes with the aim to contribute to the achievement of the targets set by the White Paper on Renewable Energy (2003). This target relates to the delivery of 10 000 GWh of energy from renewable energy sources (mainly biomass, wind, solar, and small-scale hydro) by 2013. Section C8.3.3, Energy Policy, sets out the policy guidelines for the development of energy sector, with specific refence to the renewable energy sector. » The construction of telecommunication infrastructure must be strictly regulated in terms of the spatial plans and guidelines put forward in the PSDF. They must be carefully places to avoid visual impacts on landscapes of significant symbolic, aesthetic, cultural or historic value and should blend in with the surrounding environment to the extent possible » EIAs undertaken for such construction must assess the impacts of such activities against the directives above » Renewable energy sources such as wind, solar thermal, biomass and domestic hydroelectricity are to constitute 25% of the province's energy generation capacity by 2020. The following key policy principles for renewable energy apply: » Full cost accounting: Pricing policies will be based on an assessment of the full economic, social and environmental costs and benefits of energy production and utilisation » Equity: There should be equitable access to basic services to meet human needs and ensure human well-being. Each generation has a duty to avoid impairing the ability of future generation to ensure their own well-being » Global and international cooperation and responsibilities: Government recognises its share responsibility for global and regional issues and act with due regard to the principles contained in relevant policies and applicable regional and international agreements » Allocation of functions: Government will allocate functions within the framework of the Constitution to competent institutions and spheres of government that can mostly effectively achieve the objectives of the energy policy » The implementation of sustainable renewable energy is to be promoted through appropriate financial and fiscal instruments » An effective legislative system to promote the implementation of reenable energy is to be developed, implemented, and continuously improved

Relevant policy	Relevance to the proposed project
	» Public awareness of the benefits and opportunities of renewable energy must be promoted » The development of renewable energy systems is to be harnessed as a mechanism for economic development throughout the province in accordance with the Sustainable Development Initiative (SDI)an approach » Renewable energy must, first and foremost, be used to address the needs of the province before being exported
Northern Cape Climate Change Response Strategy	The key aspects of the PCCRS Report are summarised in the MEC's (NCPG Environment and Nature Conservation) 2011 budget speech "The Provincial Climate Change Response Strategy will be underpinned by specific critical sector climate change adaptation and mitigation strategies that include the Water, Agriculture and Human Health sectors as the 3 key Adaptation Sectors, the Industry and Transport alongside the Energy sector as the 3 key Mitigation Sectors with the Disaster Management, Natural Resources and Human Society, livelihoods and Services sectors as 3 remaining key sectors to ensure proactive long term responses to the frequency and intensity of extreme weather events such as flooding and wild fore, with heightened requirements for effective disaster management Key points from the MEC's address include the NCPG's commitment to develop and implement policy in accord with the National Green Paper for the National Climate Change Response Strategy (2010) and an acknowledgment of the NCP's extreme vulnerability to climate-change driven desertification. The development and promotion of a provincial green economy, including green jobs, and environmental leadership is indented as an important provincial intervention in addressing climate change. The renewable energy sector, including solar and wind energy (but also biofuels and energy from waste), is explicitly indicated as important element to the Provincial Climate Change Response Strategy. The MEC also indicated that the NCP was involved in the processing several WEF and Solar Energy Facility EIA applications.
Northern Cape Province Green Document	The NCP Green Document (2017-2018) was prepared by the Northern Cape Department of Economic Development and Tourism and provides an impact assessment of IPPs on the communities in the province located within a 50 km radius from existing facilities. The document notes that the NCP is nationally a leader in commercial-scale renewable energy projects. By 2018 a total of 23 IPP projects in the province had been integrated into the national grid. These projects include Solar PV, Concentrated Solar and WEFs. The document notes that through their economic development obligations these projects have already made a significant positive contribution to affected communities. Much of the effort has been directed at supporting local education. The document also notes that, as these projects are committed to 20-year minimum lifespans, the collectively hold a tremendous potential for socio-economic upliftment. Key issues identified about improving the potential beneficial impact of IPPs in the NCP include: » Local community members abusing project benefits for personal gain. » Difficulty in outreach to local community beneficiaries due to high local illiteracy levels. » A lack of business skills generally hampers the successful establishment of local small enterprises which could benefit from projects. » Community benefit obligations are currently met in a piecemeal and uncoordinated fashion. » Anticipated community benefits are often frustrated by inadequate engagement and insufficient ongoing consultation.

Relevant policy	Relevance to the proposed project
	» The scarcity of people skilled in maths and sciences in local communities hampers meaningful higher-level local skills development and employment. » Insufficient support from local municipalities for IPP development.

3.6. District and Local Municipalities Policies

The strategic policies at a district and local level have similar objectives for the respective areas, namely, to accelerate economic growth, create jobs, and uplift communities. The proposed Pofadder WEF 2 and associated infrastructure is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

A brief review of the most relevant district and local municipal policies is provided in table format (**Table 3.3**) below.

Table 3.3: Relevant district and local municipal policies for the Pofadder WEF 2

Relevant policy	Relevance to the proposed project
ZF Mgcawu District Municipality Integrated Development Plan	The vision set out in the ZFMDM is "Quality support to deliver quality services". The mission is a "Centre of excellence in providing quality basic services through support to local municipalities". In terms of the National Spatial Development Perspective, the ZF Mgcawu District area has been classified as a 'medium' importance area which means that no significant investment is concentrated in the region, in terms of the National Spatial Development Perspective, the ZF Mgcawu District area has been classified as a 'medium' importance area which means that no significant investment is concentrated in the region. The IDP lists a number of strategic objectives and development objectives. The relevant objectives include **Strategic objective** To Facilitate the Development of Sustainable regional land use, economic, spatial and environmental planning frameworks that will support and guide the development of a diversified, resilient and sustainable district economy, the associated development objective is to: » Establish a vehicle to ensure all businesses are co-operating (i.e. District LED Forum) » Create investment opportunities in sectorial development (i.e. investment activities; Entrepreneurial business support programme) » Enable an environment for business establishment and support initiatives (i.e. increase the number of businesses; entrepreneurial support) **Strategic objective** To market, develop and co-ordinate tourism in the ZFMDM. The associated development objective is to: » Promote the Green Kalahari tourism brand in the ZF Mgcawu district The IDP identifies several key challenges. The following are relevant to the proposed development » High rate of unemployment » Inadequate human capital » Youth development » Access to health care facilities

Relevant policy	Relevance to the proposed project
	The IDP also notes that the ZF Mgcawu District Municipality acknowledged that climate change poses a threat to the environment, its residents, and future development. Actions are required to reduce carbon emissions (mitigation), and prepare for the changes that are projected to take place (adaptation in the District, ZF Mgcawu District Municipality has therefore prioritised the development of a Climate Change Vulnerability Assessment and Climate Change Response Report
Kai !Garib Local Municipality Integrated Development Plan 2019/2020 (June 2019	The Kai !Garib LM has identified that there is potential for further IPP projects to become operational in the LM, with several already in the planning stages. Kai !Garib LM is also a participant in the ZF Mgcawu Development Forum, an initiative coordinated by the Industrial Development Corporation (IDC) which aims to ensure that integrated development planning and implementation of regional projects take place. This includes the renewable energy and mining plants, together with other industry stakeholders such as agricultural, business and civil society stakeholders. Kai !Garib LM recognises the importance of participating in this forum to provide a platform for partnerships for regional socio-economic growth.

The implementation of Pofadder WEF 2 would contribute towards addressing the Kai !Garib local municipality key issue regarding high levels of poverty and unemployment, skills shortage, and inequalities through the creation of employment opportunities, the provision of skills training opportunities, and local economic growth, including growth in personal income levels of those community members who would be employed on the project.

3.7. Conclusion

The main findings of the review of the policy documents on all spheres of Government indicated that strong support was given towards renewable energy, specifically wind energy. The White Paper on the Energy Policy of the Republic of South Africa of 1998 stated that due to the fact that renewable energy resources operate from an unlimited resource base, for example the wind, renewable energy can increasingly contribute towards a long-term sustainable energy for future generations. This policy further highlighted that due to the unlimited resources base of renewable energy in South Africa, renewable energy applications like wind energy is considered as having lowest water consumption, lowest relative greenhouse gas emission, and most favourable social impacts. It is considered as one of the most sustainable renewable energy sources. The Integrated Resource Planning for Electricity for South Africa of 2010 – 2030, the National Infrastructure Plan of South Africa and the New Growth Path Framework all support the development of the renewable energy sector.

In particular, the IRP also indicated that 43% of the energy generations in South Africa is allocated to renewable energy applications. On District and Local level not, much attention is given particularly to renewable sources like wind energy, however the documents reviewed do make provision for energy efficiency in improving the quality of lives in terms of efficient physical infrastructure. At Provincial, District and Local level the policy documents support the applications of renewables. The Northern Cape Provincial Development and Resource Management Plan/ Provincial Spatial Development Framework (PSDF) of 2012 indicated that the development of renewable energy applications such as WEFs, could be some of the means in which the Northern Cape can benefit from economically. The review of the relevant policies and documents related to the energy section, indicate that renewables like wind energy and the establishment of WEFs are supported on all spheres of Government.

4. SOCIO-ECONOMIC PROFILE

Pofadder WEF 2 is proposed on the following farm Ganna-Poort 202; farm Lovedale 201; and portion 3 of the Farm Sand Gat 150; within Kai !Garib Local Municipality and the ZF Mgcawu District Municipality in the Northern Cape Province (refer to **Table 4-1**).

Table 4-1: Spatial Context of the study area for the development of the Pofadder Wind Energy Facility 2 and associated infrastructure

Province	Northern Cape Province
District Municipality	ZF Mgcawu District Municipality
Local Municipality	Kai !Garib Local Municipality
Ward number(s)	4 & 10
Nearest town(s)	20km South East of Pofadder
Preferred access	The project site is accessible via an existing gravel farm road from an existing main gravel road off the N14 which is located on the project site.

This Chapter provides an overview of the social environment of the province, DM, and LM within which the Pofadder WEF 2 is proposed and provides the social basis against which potential issues can be identified.

4.1. Northern Cape Province

The Northern Cape Province, is the largest province in South Africa and covers an area of 361 830 km2 and, constitutes approximately 30% of South Africa. The province is divided into five district municipalities (DM), namely, Frances Baard, Karoo, Namakwa, Pixley Ka Seme and ZF Mgcawu District Municipality (known before 1 July 2013 as Siyanda DM). Despite having the largest surface area, the Northern Cape has the smallest population of 1 193 780 (Community Household Survey, 2016) or 2.2% of the population of South Africa. Of the five districts, Frances Baard has the largest population (32.5%), followed by ZF Mgcawu District Municipality (21.2%), John Taola Gaetsewe (20.3%), Pixley ka Seme (16.4%) and Namakwa (9.7%). The majority of the population in the Northern Cape Province are Black African (48.1%), followed by Coloureds (43.7%) and Whites (7.7%).

In terms of age, 36.5% of the Northern Cape population is between 15 and 34 years old, which is the highest age distribution, followed by 29.2% of those aged 35–64 years, while only 6.6% comprised those aged 65 years and older. Similarly, this pattern is also seen across all districts in the province. The district profile shows that the highest proportions of persons aged 15–34 years were recorded in Pixley Ka Seme, ZF Mgcawu and John Taolo Gaetsewe districts. The figures for these three districts were also above the provincial average of 36.5%. The proportion of persons aged 65 years and older was higher in Namakwa (9.5%) and Frances Baard (8.2%).

The Northern Cape offers unique tourism opportunities including wildlife conservation destinations, natural features, historic sites, festivals, cultural sites, star gazing, adventure tourism, agricultural tourism, ecotourism, game farms, and hunting areas, etc. The province is home to the Richtersveld Botanical and Landscape World Heritage Site, which comprises a United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Site under the World Heritage Convention. The Northern Cape is also home to two (2) Transfrontier National Parks, namely the Kgalagadi Transfrontier Park, and the Richtersveld /Ai-Ais Transfrontier Park, as well as five (5) national parks, and six (6) provincial reserves.

The Northern Cape plays a significant role in South Africa's science and technology sector, and is home to the Square Kilometre Array (SKA), the Southern African Large Telescope (SALT), and the Karoo Array Telescope (MeerKAT).

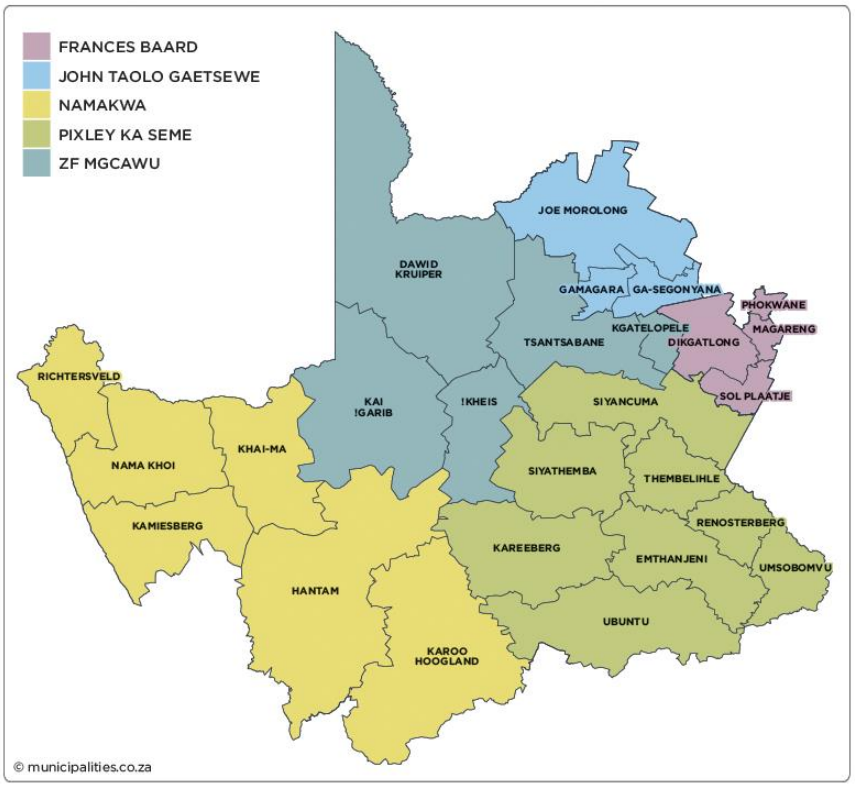


Figure 4-1: Map showing the district municipalities of the Northern Cape (Source www.municiaplities.co.za)

4.2. ZF Mgcawu District Municipality

The ZF Mgcawu District Municipality (ZFMDM) consists of five local Municipalities namely, Dawid Kruiper, Kai ! Garib, Tsantsabane, ! Kheis and Kgatelopeleand covers an area of more than 100 000km² (almost 30 % of the Northern Cape Province). Of this total, 65% (65 000km²) is made up of the Kalahari Desert, Kgalagadi Transfrntier Park and the former Bushman Land. The largest town in the region is Upington, which also functions as the district municipal capital. Following the municipal elections in 2011, Riemvasmaak (Sending and Vredesvallei) were included within the KGLM. The Riemvasmaak Community is located approximately 60 km west of Kakamas. Based on the Household Community Survey data the population of the ZFMDM was 252 692 in 2016 compared to 236 763 in 2011, The DLKM and KGLM are home to approximately 70% of the ZFMDM population.

The ZFMDM accounts for approximately 30% of the Northern Cape economy. Agriculture plays a role in the local economy and is strongly linked to irrigation along the Gariep River (Orange River). The Orange River is perennial with a flow which varies between 50 and 1800 cubic meter per second (cum/s) depending on the season. The flow of the river is largely controlled by the releases of the dams upstream, like the Bloemhof,Gariep and van der Kloof dams. Agriculture in the ZFMDM is dominated by grape production for table grapes, which is mainly exported to Europe, as well as livestock and game farming.
Tourism represents one of the most important economic sectors in the Northern Cape as well as within the ZFMDM. In this regards the ZFMDM IDP indicates that tourism is the fastest growing component of the

economy. Key tourism assets include the world renowned Kgalagadi Transfrontei Park, Augrabies National Park and Pitskop Nature Reserve near Upington.

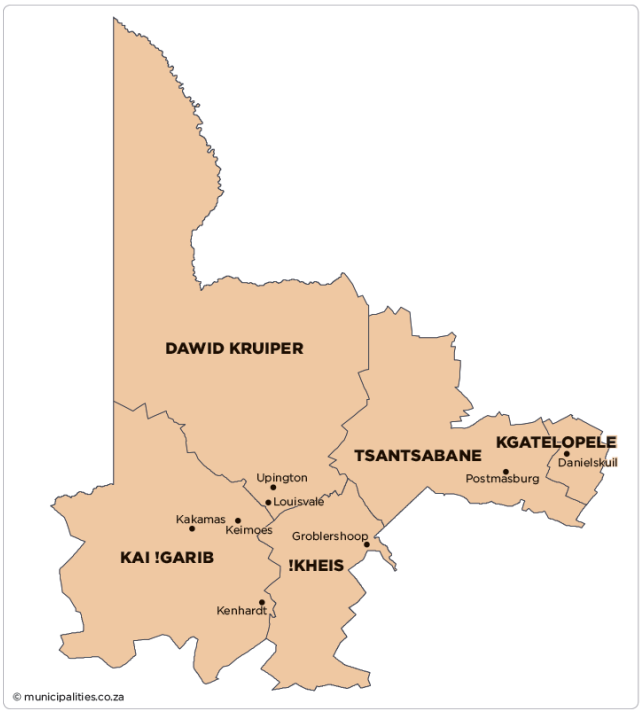


Figure 4-2: Map showing the local municipalities of the ZF Mgcawu DM (Source: www,municiaplities.co.za)

4.3. Kai !Garib LM

The Kai !Garib LM is located in the south-western extent of the ZF Mgcawu DM. It is bordered by the Dawid Kruiper LM to the north, and north-east, the! Kheis LM to the east, the Hantam LM and Khai-Ma LM of the Namakwa DM to the south and south-west respectively, and Namibia to the north-west. The Kai !Garib LM is approximately 26 377km² in extent, and is the second-largest LM in the ZF Mgcawu DM, accounting for approximately one quarter (25.7%) of the DM's geographical area. The Kai !Garib LM is characterised by its unique landscape, which includes the Kalahari Desert on one side, and the Orange River on the other.

The Kai !Garib LM is characterised by three main towns, namely: Kakamas, Keimoes, and Kenhardt. The main economic sectors within the LM include agriculture (51.8%), community and government services (15.9%), wholesale and retail trade (11.3%), finance services (7.6%), and manufacturing (5.1%)

The Orange River is the life vein of the area and forms the largest economic base of this area with large tracts of cultivated land occurring on both sides of the river. The Orange River is the biggest driving force behind the area, causing economic activities to have expanded greatly along the river over the last two decades. The main towns of Kakamas and Keimoes are situated in the midst of an intensive irrigation farming community stretching from Groblershoop in the east to Blouputs in the west. Farming includes crops like vineyards, pecan-nut, and citrus plantations. Local areas where these types of farming flourish include: Blouputs, Eksteenskuil, Riemvasmaak and Cannon Island, while Kenhardt is known for livestock farming.

4.4. Demographic and Economic Context

In this section the demographic and economic context of the respective Province, District and Local municipalities will be discussed. The information below was obtained from the Northern Cape Provincial Development and Resource Management Plan/Provincial Spatial Framework (PSDF) of 2021, the ZF Mgcawu District Municipality Draft Integrated Development Plan 2018/2019 for 2017-2022, and the Kai ! Garib Local Municipality Draft Integrated Development Plan of 2018/2019.

4.5. Project Site

Pofadder Wind Energy Facility 2 is proposed on the following farm portions Ganna-Poort 202; farm Lovedale 201; and portion 3 of the Farm Sand Gat 150 within Ward 4 and 10 of Kai !Garib Local Municipality and the Z F Mgcawu District Municipality in the Northern Cape Province. The closest major town to the project site is Pofadder, which is 20km southeast of the project site.

On the one farm portion Ganna-Poort 202 the property is accessed through a gravel road with no households/home or occupiers on the land. No predominant animals were found on the site however the site largely transformed with grazing land. Farm Sand Gat 150 is flat and consists of low scrub like bushes with vegetation of consisting of grasses. There is one big cell phone tower located on the farm.

The main agricultural activity in the area is sheep farming although it is believed that no sheep farming takes place on both the farm. The farms in the area are large (approximately 6000-8000 ha) and the farmsteads are isolated from each other.

The town of Pofadder is very small town situated on the N14 national road from Upington to Springbok, it also lies within 50km from the Namibian border. This town is therefore considered as a stop-over town for travelling tourists. The proposed Pofadder WEF 2 is in an area prone to strong and continuous winds, which is a good motivation for the placement of the Pofadder WEF 2.

4.6. Baseline Description of the Social Environment

Table 4.2 provides a baseline summary of the social profile of the Kai !Garib Local Municipality within which Pofadder Wind Energy Facility 2 is proposed. To provide context against which the Local Municipality's social profile can be compared, the social profiles of the ZF Mgcawu District, Northern Cape Province, and South Africa as a whole have also been provided where applicable. The data presented in this section have been derived from the 2011 Census, the Northern Cape Provincial Spatial Development Framework (PSDF), and the ZF Mgcawu DM and Kai !Garib LM IDPs.

Table 4.2: Baseline description of the social characteristics of the Pofadder Wind Energy Facility 2

Location characteristics
» The project is proposed within the Northern Cape Province, located in the North western corner of South Africa.
» The project is proposed within the Kai !Garib LM of the ZF Mgcawu DM.
» The Kai !Garib LM is approximately 26 377km² in extent, equivalent to approximately one quarter (25.7%) of the ZF Mgcawu DM.
Population characteristics
» Between 2001 and 2011 the Kai !Garib LM experienced a population growth rate of 1.2% per year.

- The Kai !Garib LM is male dominated, with males comprising approximately 52.0% of the LM population. The ZF Mgcawu DM is also male dominated, with males comprising approximately 50.8% of the DM population.
- Coloureds comprise the predominant population group within the Kai !Garib LM and ZF Mgcawu DM.
- The Kai !Garib LM, ZF Mgcawu DM, and Northern Cape provincial, and South African national population age structures are all youth dominated. A considerable proportion of the respective populations therefore comprise individuals within the economically active population between the ages of 15 and 64 years of age.

Economic, education and household characteristics

- The Kai !Garib LM has a dependency ratio of 29.5, which is lower than the ZF Mgcawu DM (33.6), Northern Cape Province (35.8), and South Africa (34.5).
- Education levels within the Kai !Garib LM are low with approximately 70.6% of the population aged 20 years and older who have received some form of schooling not having completed Grade 12 / Matric. This implies that much of the population can be expected to have a relatively low-skill level and would either require employment in low-skill sectors, or skills development opportunities in order to improve the skills level of the area.
- The unemployment rate of the Kai !Garib LM (6.7%) is lower than that of the ZF Mgcawu DM (11.3%), and the percentage of economically inactive individuals within the Kai !Garib LM (31.3%) is also lower than that of the ZF Mgcawu DM (38.3%).
- Household income levels within the Kai !Garib LM are very low, with approximately 84% falling within the poverty level (i.e. R0 – R38 400 per annum). The area can therefore be expected to have a high poverty level with associated social consequences such as not being able to pay for basic needs and services and poor living conditions.
- The main economic sectors within the Kai !Garib LM include agriculture (51.8%), community and government services (15.9%), wholesale and retail trade (11.3%), finance services (7.6%), and manufacturing (5.1%).
- As of 2011 there were a total of 22 260 households within the Kai !Garib LM. This is equivalent to 32.9% of the total number of households within the ZF Mgcawu DM (67 468), and 7.1% of the total number of households within Northern Cape Province (313 402).
- The majority of households (56.3%) within the Kai !Garib LM comprise formal brick dwellings, while 1.7% comprise traditional dwellings, 4.3% comprise informal dwellings not in a backyard, and 0.4% comprise informal dwellings in a back yard.

Services

- The Kai !Garib LM is poorly serviced in terms of public sector health facilities with one hospital located in Kakamas, and a number of clinics, satellite clinics, mobile facilities and community health centres throughout the LM.
- The majority of households within the Kai !Garib LM are adequately serviced with regards to water, sanitation, electricity, and refuse removal, however there is significant room for improvement in terms of service delivery within the LM, with the LM often exhibiting lower levels of service provision than that of the ZF Mgcawu DM, Northern Cape Province, and South Africa as a whole.

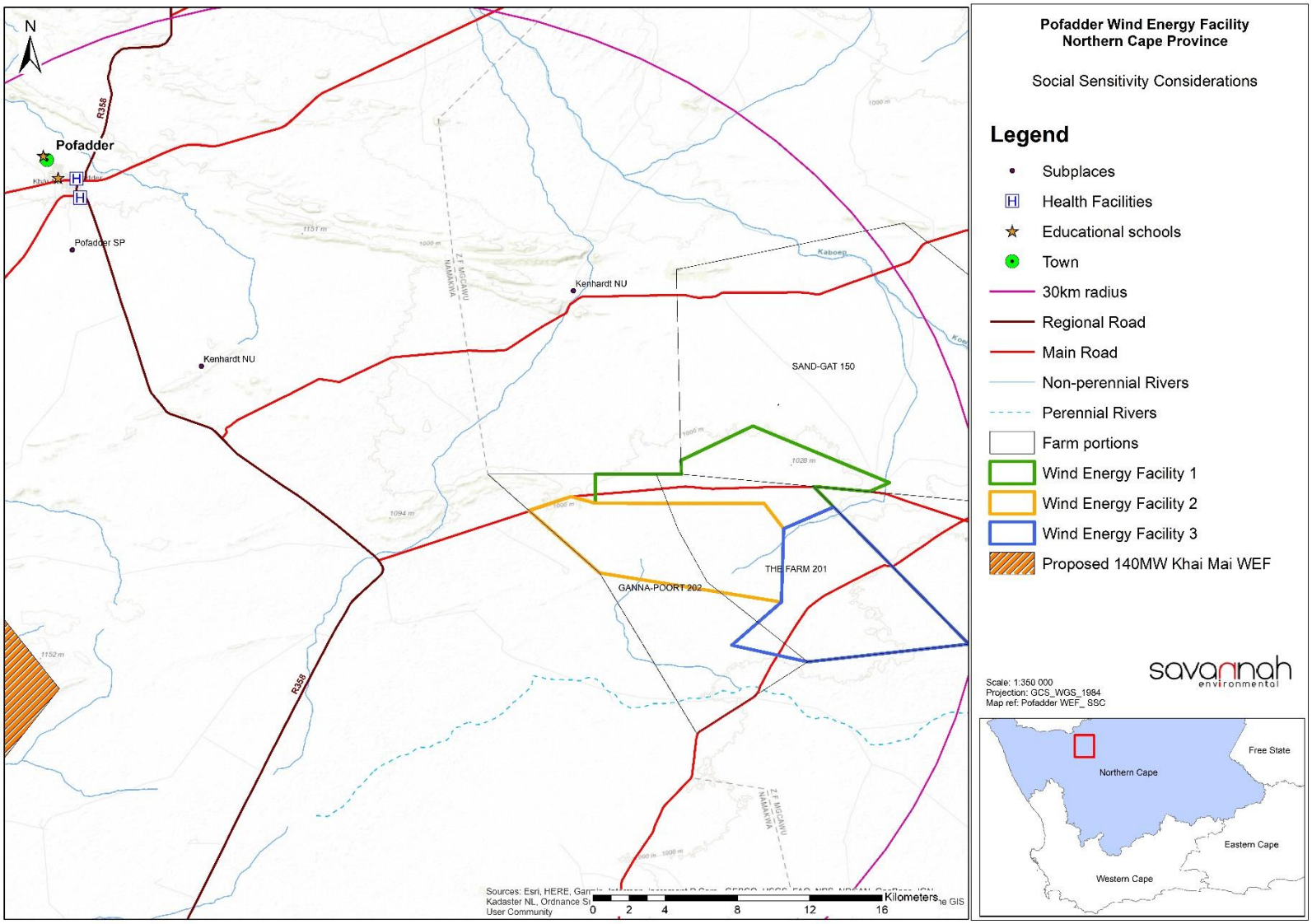


Figure 4-3 Social Sensitivity considerations for the Pofadder Wind Energy Facility Cluster

5. ASSESSMENT OF POTENTIAL SOCIAL IMPACTS

This section provides an overview of the potential social impacts that have been identified, which may be associated with the development of Pofadder WEF 2. Potential impacts have been identified based on the current understanding of the project and the social environment within which it is proposed.

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

5.1. Construction Phase Impacts associated with Pofadder Wind Energy Facility 2

Most social impacts associated with the project are anticipated to occur during the construction phase of the development and are typical of the type of social impacts generally associated with construction activities. These impacts will be temporary and short-term (~48 months) but could have long-term effects on the surrounding social environment if not planned or managed appropriately. It is therefore necessary that the detailed design phase be conducted in such a manner so as not to result in permanent social impacts associated with the ill-placement of project components or associated infrastructure or result in the mismanagement of the construction phase activities.

The following paragraph seeks to provide a short description of the positive and negative social impacts identified for both the construction and operational phase.

Air quality – Wind Energy Facility often have some air quality impacts although this is subject to a separate specialist study, but there are potential impacts on health.
Noise- The operation of the wind turbines has the potential to result in the generation of noise levels that could have nuisance and health impacts for surrounding communities (Michaud, et al., 2016). In research undertaken in Denmark (Poulsen, et al., 2019) it was found that there was a positive association in the redemption of sleep medication and antidepressants regarding the exposure to high levels of out-door night-time noise; particularly amongst the elderly, >65 years of age. However, no consistent association with low-frequency indoor night-time wind turbine noise was found. Suggestive evidence, to be interpreted with caution, was found linking atrial fibrillation to long-term exposure to wind turbine noise amongst female nurses above 44 years (Bräuner,et al., 2019).
Crime – The influx of job seekers and increase in presence and behaviours can impact community structures and social networks, competition for housing and job, which may lead to crime related activities.
HIV Infections – The risk of HIV infections is likely to be at its highest during the construction phase as workforce increases and material and equipment is delivered to the site. The risk of HIV infection is most prevalent cumulatively and needs to be closely monitored
Construction workers - In a typical Wind Energy Facility the peak of construction workforce will stretch over 12 to 24 month period. As workers seek job and the number of workers in the area influx's this could lead to the disruption of social networks with the formation of temporary relationships and an increase in pregnancy which may place pressures on local family units.
Hazard exposure- the highest risks associated with wind energy facilities occur during transportation and construction. The use of heavy equipment and vehicles an increase in vehicle traffic within the vicinity may result in an increased risk to the personal safety of people and animals.

Daily living – the way in which normal day to day activities will change due to the development is mainly through the site access that is required at the facility and the main access for roads. This normal daily living will be through delivering of materials and machinery to the site and transportation of workers to and from site,

Social and community infrastructure - the change to daily living will affect the social and community infrastructure however from a cumulative perspective. The increase in renewable energy facilities in the area, it is quite likely that the local authorities currently find it hard-pressed to deliver services. As there is an increase in migration in the area there is pressure on accommodation and the need for more services and supplies.

Job creation and skills development – the project will lead to the creation of both direct and indirect jobs which will have a positive economic benefit.

Socio-economic stimulation – apart from the jobs the project is likely to stimulate the local economy through the form of disposable salaries and purchases of services and supplied from the local communities in and around Pofadder.

Shadow flicker – the shadow flicker may have health-related issues that would need to be considered, this is through careful siting of wind turbined to avoid residential areas and locations frequented by tourists.

Blade glint – The traveling to the facility at different times of the day may affect the glint to the residents, however this can be mitigated through non reflective coatings and by appropriately angling the blades to limit the amount of reflection

Electromagnetic field and RF interference – these are have been associated with grid connection power lines and wind turbines generators, although the extent of this risk remains unclear (Krogh & Harrington, 2019).

Transformation of the sense of place - this is concern through various interest groups that as renewable energy facilities increase and when considered in association with other industrial activities there is a significant and negative cumulative impact in the area.

The positive and negative social impacts identified at this stage and will be assessed for the construction phase includes:

- Air quality
- Noise
- Increase in crime
- Increased risk of HIV infections
- Influx of construction workers
- Hazard exposure
- Disruption of daily living patterns
- Disruptions to social and community infrastructure
- Job creation and skills development
- Socio-economic stimulation

5.2. Operations Phase Impacts associated with Pofadder Wind Energy Facility 2

The development will also need to consider the impacts in the operation phase and the following is associated with the operations phase of the project:

- Noise (associated with the energy facility and not the grid infrastructure)
- Shadow flicker (associated with the energy facility and not the grid infrastructure)

- Blade glint (associated with the energy facility and not the grid infrastructure)
- Electromagnetic field and RF interference
- Hazard exposure
- Transformation of the sense of place
- Job creation and skills development
- Socio-economic stimulation

5.3. No Go Option

The option of not having this project go ahead means that the social environment is not affected as the status quo remains. On a negative basis, it also means that all positive aspects associated with the project would not materialise. This would mean that there is no job creation, no revenue streams into the local economy and no opportunity to enhance the National Grid with renewable source of energy,

5.4. Decommissioning

It is estimated that the project will have a lifespan of approximately 25 years and that there is a possibility that after this period the facility could be replace with more up-to-date technology, extending the project lifespan even further. Considering this period, and that between commissioning and decommissioning a great deal of social change is certain to occur, it will be meaningless to assess the social impact of decommissioning as the social variables that are likely to be in play at the point of decommissioning are rather uncertain. Loss of jobs would be likely to result in permanent consequences. It is important that mitigation measures are taken into consideration with ensuring that retracement package is in place. Ensure that staff are trained to provide them with saleable skills within the job market and lastly ensuring that the site is cleared responsibly and left in safe condition.

5.5. Cumulative impacts

The cumulative economic impact of the project will be both positive and negative. The negative economic impacts, associated with a possible rise in living costs driven by market demand, are considered under the section above. In this section, the positive economic impacts will be addressed.

From a positive perspective, the proliferation of renewable energy facilities within the region is likely to result in significant and positive cumulative impacts in the area in terms of both direct and indirect job creation, skills development, training opportunities, and the creation of business opportunities for local businesses. In this regard it is indicated in the REIPPPP Quarterly Report, as at 30 September 2020, that in respect of South Africa that," ..*the REIPPPP is targeting broader economic and socio-economic developmental benefits*"… "*[t]o date, a total of 55 217 job years have been created for South African citizens, of which 44 290 were in construction and 10 927 in operations" (Independent Power Producer Office, 2020a, p. 24 & 28). In addition to this "[t]he combined (construction and operations) procurement value is projected as R149.9 billion, of which R82.7 billion has been spent to date. For construction, of the R71.2 billion already spent to date, R60.0 billion is from the 71 projects which have already been completed. These 71 projects had planned to spend R54.6 billion. The actual procurement construction costs have therefore exceeded the planned costs by 10% for completed projects."*

The district and local municipalities within the area have identified renewable energy as a strategic economic opportunity in a region that previously had few such opportunities. This is indicated in the various IDPs and LEDs pertaining to the affected municipalities.

Table 5-1: Construction: Rating of Impacts & Mitigation/ Optimisation Measures

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDEDMITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
	Noise	1	1	1	1	3	1	6	-	Low	Refer to mitigation measures suggested by noise specialist	1	1	1	1	1	1	**6**	-	Low
	Increased in crime	2	2	3	2	2	2	18	-	Low	Ensure that construction workers are clearly identifiable. All workers should carry identification cards and wear identifiable clothing. Fence off the construction sites and control access to these sites. Appoint an independent security company to monitor the site; Encourage local people to report any suspicious activity associated with the construction sites through the establishment of a community liaison forum. Prevent loitering within the vicinity of the construction camp as well as construction sites	2	2	3	2	2	2	**18**	-	Low
	Increased risk of HIV infections	3	4	3	3	3	3	48	-	High	Ensure that an onsite HIV Infections Policy is in place and that construction workers have easy access to condoms. Expose workers to a health and HIV/AIDS awareness educational program. Extend the HIV/AIDS program into the community with a specific focus on schools and youth clubs.	3	3	2	2	3	2	**16**	-	Medium
	Influx of construction workers	1	4	1	1	1	2	16	-	Low	Communicate the limitation of opportunities created by the project through Community Leaders and Ward Councillors. Draw up a recruitment policy in consultation with the Community Leaders and Ward Councillors of the area and ensure compliance with this policy.	1	4	1	1	1	2	**16**	-	Low
	Hazard exposure	2	4	2	2	1	2	22	-	Low	Ensure that all construction equipment and vehicles are properly maintained at all times. Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly. Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to. Make staff aware of the dangers of fire during regular toolbox talks.	2	2	2	2	1	2	**18**	-	Low
Quality of the living environment	Disruption of daily living patterns	2	4	2	2	1	2	22	-	Low	Ensure that, at all times, people have access to their properties as well as to social facilities	2	3	2	2	1	2	**20**	-	Low
	Disruptions to social and community infrastructure	2	4	2	2	1	2	22	-	Low	Regularly monitor the effect that construction is having on infrastructure and immediately report any damage to infrastructure to the appropriate authority. Ensure that where communities' access is obstructed that this access is restored to an acceptable state	2	3	2	2	1	2	**20**	-	Low
Economic	Job creation and skills development	2	4	2	3	1	2	24	+	Medium	Wherever feasible, local residents should be recruited to fill semi and unskilled jobs. Women should be given equal employment opportunities and encouraged to apply for positions. A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere postconstruction.	2	4	2	3	1	2	**24**	+	Medium

	Socio-economic stimulation	3	4	2	3	1	2	26	+	Medium	A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase.	3	4	2	3	1	2	**26**	+	Medium

Table 5-2: Operational: Rating of Impacts & Mitigation/ Optimisation Measures

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDEDMITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Operation Phase																				
	Shadow flicker WEF only	1	2	1	2	3	2	18	-	Low	Refer to mitigation measures suggested by visual specialist	1	2	1	2	3	2	**18**	-	Low
	Blade glint WEF only	2	2	1	2	3	2	20	-	Low	Ensure that construction workers are clearly identifiable. All workers should carry identification cards and wear identifiable clothing. Fence off the construction sites and control access to these sites. Appoint an independent security company to monitor the site; Encourage local people to report any suspicious activity associated with the construction sites through the establishment of a community liaison forum. Prevent loitering within the vicinity of the construction camp as well as construction sites	2	2	1	2	1	2	**16**	-	Low
	Electromagnetic field and RF interference	2	2	1	2	2	2	18	-	Low	Wind turbine mechanisms will be elevated and the risk of EMFs will be minimal. Notwithstanding this, it would be pertinent to regularly monitor the levels of EMFs emitted by the turbines and, if necessary, make the appropriate adjustments to ensure that these levels remain within acceptable parameters. Ensure that power lines are not routed in close proximity (with 300 meters) of residential areas to limit the effect off EMFs. Consult with the appropriate telecommunication authorities to ensure that the telecommunication installations identified within the vicinity of the project are not comprised through RFI	2	2	1	2	2	2	**18**	-	Low
	Hazard exposure	1	2	2	2	3	2	22	-	Low	Install early detection techniques to avoid or reduce structural damage Install lighting protection systems Install five prevention and control measures	1	2	2	2	3	2	**22**	-	Low
Quality of Living environment	Transformation of sense of place	2	3	2	1	4	3	36	-	Medium	Apply the mitigation measures suggested in the Visual Impact Assessment Report. Communicate the benefits associated with renewable energy to the broader community. Ensure that all affected landowners and tourist associations are regularly consulted. A Grievance Mechanism should be put in place and all grievances should be dealt with transparently. The mitigation measures recommended in the Heritage and Palaeontology Impact Assessment should be followed.	2	2	2	1	4	2	**22**	-	Low
Economic	Job creation and skills development	2	4	2	2	3	2	26	+	Medium	Implement a training and skills development programme for locals. Work closely with the appropriate municipal structures regarding establishing a social responsibility programme.	2	4	2	2	3	2	**26**	+	Medium
	Socio-economic stimulation	4	4	2	3	3	2	32	+	Medium	Ensure that the procurement policy supports local enterprises. Establish a social responsibility programme either in line with the REIPPP requirements or equivalent. Work closely with the appropriate municipal structures regarding establishing a social responsibility programme. Ensure that any trusts or funds are strictly managed in respect of outcomes and funds.	4	4	2	3	3	2	**32**	+	Medium

Table 5-3: No Go: Rating of Impacts & Mitigation/Optimisation Measures

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDEDMITIGATION MEASURES
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
The project does not proceed	The status quo remains in place No positive or negative impacts occur	4	4	2	4	3	3	**51**	-	High	The only mitigation measure would be to proceed with the project which would revise the negative impact to positive

Table 5-4: Decommissioning

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDEDMITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Decommissioning Phase																				
Economic	Job loss	2	4	2	3	1	2	24	+	Medium	Major social impacts associated with decommissioning phase are linked to the loss of jobs and associated income. As part of this decommissioning phase it would likely involve the disassembly and replacement of existing components with more modern technology therefore creation of additional construction type jobs although limited. It is recommended that the implementation of a retrenchment and downscaling programme be implemented.	2	4	2	3	1	2	**24**	+	Medium

Table 5-5: Cumulative: Rating of Impacts & Mitigation /Optimisation Measures

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S	
Cumulative Phase											

Health and social wellbeing	Noise	1	3	2	2	3	2	**22**	-	Low	With regard to the cumulative impacts, mitigation can only be considered implemented through a readiness action plan at a regional level and will driven on a provincial and municipal basis; underpinned by national government, private sector and public support. In this regard the Draft Consolidated Intergovernmental Readiness Report for large development scenarios Karoo (Western Cape Government Environmental Affairs and Development Planning, 2019) acknowledges the need to prepare for large-scale, or development proposals and to enlist national government, private sector participation.
	Shadow Flicker	1	3	2	2	3	2	**22**	-	Low	
	Blade glint	2	3	2	2	3	2	**24**	-	Low	
	Risk of HIV and AIDS	4	3	4	3	4	3	**54**	-	High	
Quality of the living environment	Sense of place	2	4	4	3	4	3	**51**	-	Medium	
	Service supplies and infrastructure	2	3	2	2	2	2	**22**	-	Low	
Economic	Job creation and skills development	4	4	3	3	3	4	**68**	+	Very high	
	Socio-economic stimulation	2	4	2	2	3	2	**26**	+	Medium	

Decommissioning Phase		
Considering a time period of 20 years prior to decommissioning and the dynamics of social variables, it would be rather meaningless to attach assessment criteria to decommissioning at this point due to report.		
No Project Alternative		
No project "No- go"		-51
Cumulative Impacts		
Health & social well-being	Noise	-22
	Shadow flicker	-22
	Blade glint	-24
	Risk of HIV	-54
Quality of the living environment	Sense of place	-51
	Services, supplies & infrastructure	-22
Economic	Job creation and skills development	+26
	Socio-economic stimulation	+68

5.6. Overall Impact Rating

All impacts, as assessed across all project phase above, are summarised and a pre and post-mitigation comparison is presented in the table below.

Table 5-6: Summary of Impacts

Construction Phase			
Environmental parameter	**Issues**	**Rating prior to mitigation**	**Rating post-mitigation**
Health & Social wellbeing	Air quality	Negative Low Impact	Negative Low Impact
	Noise	Negative Low Impact	Negative Low Impact
	Increase in crime	Negative Low Impact	Negative Low Impact
	Increase risk of HV infections	Negative Very High Impact	Negative Medium Impact
	An influx of construction workers	Negative Low Impact	Negative Low Impact
	Hazard exposure	Negative Low Impact	Negative Low Impact
Quality of the living environment	Disruption of daily living patterns	Negative Low Impact	Negative Low Impact
	Disruption to social and community infrastructure	Negative Low Impact	Negative Low Impact
Economic	Job creation and skills development	Positive Medium Impact	Positive Medium Impact
	Socio-economic stimulation	Positive Medium Impact	Positive Medium Impact
Operational Phase			
Healthy & Wellbeing	Noise	Negative Low Impact	Negative Low Impact
	Shadow flicker	Negative Low Impact	Negative Low Impact
	Blade glint	Negative Low Impact	Negative Low Impact
	Electromagnetic fields and RF interference	Negative Low Impact	Negative Low Impact
	Hazard exposure	Negative Low Impact	Negative Low Impact
Quality of the living environment	Transformation of the sense of place	Negative High Impact	Negative Medium Impact
	Job creation and skills development	Positive Medium Impact	Positive Medium Impact
Economic	Socio-economic stimulation	Positive Medium Impact	Positive Medium Impact
Cumulative			
Health and social wellbeing	Noise	Negative Low Impact	Negative Low Impact
	Shadow Flicker	Negative Low Impact	Negative Low Impact
	Blade glint	Negative Low Impact	Negative Low Impact
	Risk of HIV and AIDS	Negative High Impact	Negative High Impact
Quality of the living environment	Sense of place	Negative High Impact	Negative Medium Impact
	Service supplies and infrastructure	Negative Low Impact	Negative Low Impact
Economic	Job creation and skills development	Positive Very High Impact	Positive Very High Impact
	Socio-economic stimulation	Positive Medium Impact	Positive Medium Impact

6. CONCLUSION AND SUMMARY

6.1. Key findings and Recommendations

Considering the impacts discussed above, it is evident that the cumulative impacts associated with changes to the social environment of the region are more significant than those attached to any one project.
The initiative to address these cumulative impacts lies at a far higher level than at an individual project level. In this regard conclusions are drawn to the findings of this assessment conducted for the proposed Pofadder Wind Energy Facility 2 which indicates that during the construction and the operational phase of the proposed development, various employment opportunities, with different levels of skills will be created. In addition this will create local business opportunities benefitting the socio-economic development of the local community of Pofadder.

6.2. Impact Statement

Considering all social impacts associated with the project, it is evident that, at the social level, the positive elements outweigh the negative and that the project carried with it a significant social benefit at a national level and is therefore supported, In addition, no compelling preference emerges in respect of the revised proposed layout and considerable sensitives have been avoided and it would be socially acceptable for the authorisation of Pofadder WEF 2. All negative impacts are low and can be effectively addressed through the mitigation measures provided.

6.3. Overall Conclusion

The proposed project and associated infrastructure will create a number of potential socio-economic opportunities and benefits and is unlikely to result in permanent damaging social impacts. From a social perspective it is concluded that the project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the project. Considering the findings of the report and potential for mitigation it is the reasoned opinion of the specialist that the project can be authorised from a social perspective", is also supported by the findings of the Peer Review.

7. REFERENCES

Aylin, A., Çolak, A., & Dağdeviren, M. (2018). An integrated model using SWOT analysis and Hesitant fuzzy linguistic term set for evaluation occupational safety risks in life cycle of wind turbine. Safety Science. Volume 106, July 2018, 184-190.

Department of Energy (DoE). (2008). National Energy Act (No. 34 of 2008). Republic of South Africa.

Department of Energy (DoE). of South Africa. (2011).National Integrated Resource Plan for Electricity 2010-2030. Republic

Department of Energy (DoE). (2003). White Paper on Renewable Energy. Republic of South Africa.

Department of Environmental Affairs (DEA). (1998). National Environmental Management Act 107 of 1998 (No. 107 of 1998). Republic of South Africa.

Department of Environmental Affairs (DEA). (2010). National Climate Change Response Green Paper. Republic of South Africa.

Department of Justice (DoJ). (1996). The Constitution of the Republic of South Africa (Act 108 of 1996). ISBN 978-0-621-39063-6. Republic of South Africa.

Department of Minerals and Energy (DME). (1998). White Paper on Energy Policy of the Republic of South Africa. Republic of South Africa.

Hamed, T. A., & Alshare, A. (2021). Environmental Impact of Solar and Wind energy- A Review. J. sustain. dev. energy water environ. syst., 1090387, DOI:
https://doi.org/10.13044/j.sdewes.d9.0387.

Kai !Garib Local Municipality. (202019/2020). Kai! Garib Local Municipality Integrated Development Plan (IDP), 2017 – 2018.

Krogh, C. M., & Harrington, M. E. (2019). Wind Turbine Electromagnetic Energy: Exploring Risk of Harm to Human Health. Alternative Therapies in Health and Medicine. Vol. 25, Iss. 3, 32-38.

International Finance Corporation (IFC). (2007). Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets. International Finance Corporation: Washington.

Interorganizational Committee on Principles and Guidelines for Social Impact Assessment. US Principles and Guidelines – Principals and guidelines for social impact assessment in the USA. Impact Assessment and Project Appraisal, 21(3): 231-250.

National Development Agency (NDA). (2014). Beyond 10 years of unlocking potential. Available from: http://www.nda.org.za/?option=3&id=1&com_id=198 &parent_id= 186&com_task=1

National Planning Commission. (2012). National Development Plan 2030. ISBN: 978-0-621-41180-5. Republic of South Africa.

Northern Cape Provincial Growth and Development Strategy

Northern Cope Provincial Growth and Development Strategy (2004-2014).

Northern Cape Provincial Government. (2012). Northern Cape Provincial Spatial Development Framework (PSDF) 2012.

Northern Cape Provincial Government. (2018). Northern Cape Reviewed Spatial Development Framework (PSDF) Executive Summary 2018

Statistics South Africa. (2011). Census 2011 Community Profiles Database. Pretoria.

United Nations Environment Programme (UNEP). (2002). EIA Training Resource Manual. 2nd Ed. UNEP.

United Nations Economic and Social Commission for Asia and the Pacific (UN). (2001). Guidelines for Stakeholders: Participation in Strategic Environmental Management. New York, NY: United Nations.

Vanclay, F. (2003). Conceptual and methodological advances in Social Impact Assessment. In Vanclay, F. & Becker, H.A. 2003. The International Handbook for Social Impact Assessment. Cheltenham: Edward Elgar Publishing Limited.

ZF Mgcawu District Municipality. (2019). ZF Mgcawu District Municipality Final Integrated Development Plan (IDP) 2019/2020 (2017-2022)

Annexure 1

It is recommendation that the following measures are included in the EMPr and EA, should such authorisation be granted by DFFE.

Pre-construction / Design Phase:

No measures are recommended to be included in the EMPr and EA for the pre-construction and/or design phase.

Construction Phase:

Impact/Aspect	Mitigation/ Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
Noise	The mitigation measures suggested by the noise specialist	The proponent in association with contractors	As stated by the noise specialist	Frequency of complaints laid and the time lag between notification of the complaint and resolutions.	Over construction & operation phases of the project
Increase in crime	Ensure that constructions workers are identifiable. All workers should carry identification cards and wear identifiable clothing. Encourage local people to report any suspicious activity associated with the construction sites through the establishment of community liaison forum. Prevent loitering within the vicinity of the construction camp and construction sites	The proponent in association with contractors	Safety of workforce including security on project site. Fence and secure project site	To minimise the risk potential for local communities	Over the construction phase of the project.
Increase in HIV Infections	Ensure that an onsite HIV Infections Policy is in place and	Human resource department and project manager	Implement an HIV/AIDs Awareness and Training Programme for	To minimise the risk of the spread of STD's and HIV in the area.	Over construction & operation phases of the project

Impact/Aspect	Mitigation/ Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
	that construction have easy access to condoms Expose workers to a health and HIV/Aids awareness educational program.		contractors workforce within two weeks of commencement of construction		
An influx of construction workers	Communicate the limitation of opportunities created by the project through Community Leaders and Ward Councillors. Draw up a recruitment policy in consultation with the community leaders and Ward Councillors of the area and ensure compliance with this policy	The proponent in association with contractors	As far possible source low-skilled workers from local communities and surrounding areas If feasible employ local contractors	To minimise the disruptive effect that the workforce may pose for local communities	Over construction phase of the project
Hazard exposure	Ensure all construction equipment and vehicles are properly maintained at all times Ensure that operations and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population, such as children and the elderly. Ensure that fires lit by construction staff are only ignited in designated areas and that the	The proponent in association with contractors	Provide relevant protection equipment and training to all staff personnel	To avoid and or minimise the potential risk of hazardous exposure on local communities and their livelihoods	Over construction phase of the project

Impact/Aspect	Mitigation/ Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
	appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to. Make staff aware of the danger of fire during toolbox talks				
Disruption of daily living pattens	Ensure that, at all times, people have access to their properties as well as to social facilities.	Project proponent in association with contractors	A public grievance and incident register should be established and should be monitored internally by the developer and made available for public scrutiny if requested	Register to be audited to understand any issues regarding property issues.	During operational phase on a monthly basis
Disruptions to social and community infrastructure	Regularly monitor the effect that construction is having on infrastructure and immediately report any damage to infrastructure to the appropriate authority.	Project proponent in association with contractors	A public grievance and incident register should be established and should be monitored internally by the developer and made available for public scrutiny if requested	Register to be audited to understand any issues regarding property issues.	During operational phase on a monthly basis

Operational Phase:

Impact/Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
Noise	The mitigation measures suggested by the noise specialist	The proponent in association with contractors	As stated by the noise specialist	Frequency of complaints laid and the time lag between notification of the complaint and resolutions.	Over construction & operation phases of the project
Shadow flicker	Identifying receptor points and applying appropriate technical measures such as computer modelling in sitting the wind turbines to limit the effect of shadow flicker. Where necessary and appropriate apply tracking technology that will automatically shutoff and restart the affecting wind turbine to eliminate shadow flicker Consider the application of appropriate screening measures to reduce the effect of shadow flicker	The proponent in association with service providers	Assessment through and health-related issues	Through careful siting of wind turbines to avoid residential areas	During operation phase
Blade glint	Calculate and factor in the risk of blade glint in siting the wind turbines Coat wind turbine blades with non-reflective costing to reduce blade glint. Where appropriate, adjust the angle of turbine blades to reduce blade glint.	The proponent in association with service providers	Assessment through residents or visitors coming into the area	The use of non-reflective coatings	During operation phase

Impact/Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
Electromagnetic fields and RF interference	Wind turbine mechanism will be elevated and the risk of EMF's will be minimal. Notwithstanding this, it would be pertinent to regularly monitor the levels of EMFs entitled by the turbines and, if necessary make the appropriate adjustments to ensure that these levels remain within acceptable parameters. Ensure that power lines are not routed in close proximity (with 300 meters) of residential areas to limit the effect of EMFs. Consult with the appropriate telecommunication authorities to ensure that the telecommunication installations identified within the vicinity of the project are not comprised through RFI.	The proponent in association with service providers	Through consultation with relevant authorities under this area of expertise	Ensure project area is not compromised due to any RF interference	During operation phase
Hazard exposure	Install early detection techniques to avoid or reduce structural damage Install lighting protection systems Install fire prevention and control measures	The proponent in association with project manager	Safety measures to be adhered too at all times.	Avoid any hazard exposure of the development to reduce any damages	During operation phase

Impact/Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
Transformation of the sense of place	Apply the mitigation measures suggested in the Visual Impact Assessment Report. Communicate the benefits associated with renewable energy to the broader community Ensure that all affected landowners and tourist associations are regularly consulted A Grievance Mechanism should be put in place and all grievance should be dealt with transparently The mitigation measures recommended in the Heritage and Palaeontology Impact Assessment should be followed.	The proponent in association with project manager	Through consultation understand concerns regarding to changes in visual perspective and address matters	As part of the consultation should there be grievances then a grievance mechanism needs to be in place and dealt with openly	During construction & construction phase
Socio-economic stimulation	Ensure that the procurement policy supports local enterprises Establish a social responsibility programme either in line with the REIPPP BID guidelines or equivalent; Work closely with the appropriate municipal structures regarding establishing a social responsibility programme;	The proponent	Develop policies in place that aligns with local economic plan of the municipality	Work closely with the municipality and various people with the structures of the organisation	During operation, construction and decommissioning phase

Impact/Aspect	Mitigation/Management Actions	*Responsibility*	*Methodology*	Mitigation/Management Objectives and Outcomes	*Frequency*
	Ensure that any trusts or funds are strictly managed in respect of outcomes and funds				

APPENDIX A:
QUESTIONNAIRE USED FOR CONSULTATION

savannah environmental

Social Impact Assessment Questionnaire

INTRODUCTION

Savannah Environmental (Pty) Ltd was appointed by Pofadder Wind Facility 1 (Pty) Ltd to conduct an assessment of the potential impacts to socio-economic impact that might occur through the proposed development of the Pofadder Wind Energy Facility (WEF) 1 on a site to the southeast of Pofadder, Northern Cape. The project is part of a set of three WEFs planned over four farm portions as shown in Table 1. Note that three separate environmental processes are being undertaken for the three projects and will run concurrently. An approximate centre of the Pofadder WEF 1 turbine cluster is at S29° 17' 45" E19° 41' 30".

Table 1 *Farm portions involved in the overall project.*

Farm Portion	Pofadder WEF 1	Pofadder WEF 2	Pofadder WEF 3
De Neus 149/remainder			
Sand Gat 150/3			
Lovedale 201/remainder			
Ganna-Poort 202/remainder			

OVERVIEW OF THE POFADDER WIND ENERGY FACILITY PROJECT

The applicant Pofadder Wind Energy 1 (Pty) Ltd is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure on a site located approximately 20km South East of Pofadder within the Kai !Garib Local Municipality and the Z F Mgcawu District Municipality in the Northern Cape Province.

Two additional WEF's are concurrently being considered on the properties and are assessed by way of separate impact assessment processes contained in the 2014 Environmental Impact Assessment (EIA) Regulations (GN No. R982, as amended) for listed activities contained Listing Notices 1, 2 and 3 (GN R983, R984 and R985, as amended). These projects are known as Pofadder Wind Energy Facility 2 and Pofadder Wind Energy Facility 3.

The Pofadder WEF project site is proposed to accommodate the following infrastructure, which will enable the wind farm to supply a contracted capacity of up to 200MW:

- Up to 30 wind turbines with a maximum hub height of up to 200m;
- A transformer at the base of each turbine;
- Concrete turbine foundations and turbine hardstands;
- Temporary laydown areas which will accommodate the boom erection, storage and assembly area;
- Cabling between the turbines, to be laid underground where practical;
- An on-site substation of up to 1.25ha in extent to facilitate the connection between the wind farm and the electricity grid;
- An internal overhead 132kV power line, with a servitude of 32m, to connect the wind farm to the collector substation;
- Access roads to the site and between project components inclusive of stormwater infrastructure. A 12 m road corridor may be temporary impacted during construction and rehabilitated to 6m wide after construction;

- Pofadder WEF 1 will have a total road network of about 50 km.
- A temporary concrete batching plant; and
- Operation and Maintenance buildings including a gate house, security building, control centre, offices, warehouses, a workshop and visitors centre.

MORE ABOUT WIND ENERGY TECHNOLOGY

Wind energy is the use of the wind as an energy source. A wind energy system transforms the moving (kinetic) energy of the wind into mechanical or electrical energy that can be harnessed for practical use. Harnessing the wind for electricity generation is the most commonly known form of renewable energy today.

Wind turbines use the energy from the wind to generate electricity. A wind turbine consists of four large main components (Figure 1):

- The rotor
- The nacelle
- The tower
- The foundation unit

Figure 1: Main components of a wind turbine

The wind blows through blades, which converts the wind's energy into electricity via a generator located in the nacelle. Turbines are able to operate at varying speeds. The amount of energy a turbine can harness depends on both the wind velocity (strength) and the length of the rotor blades.

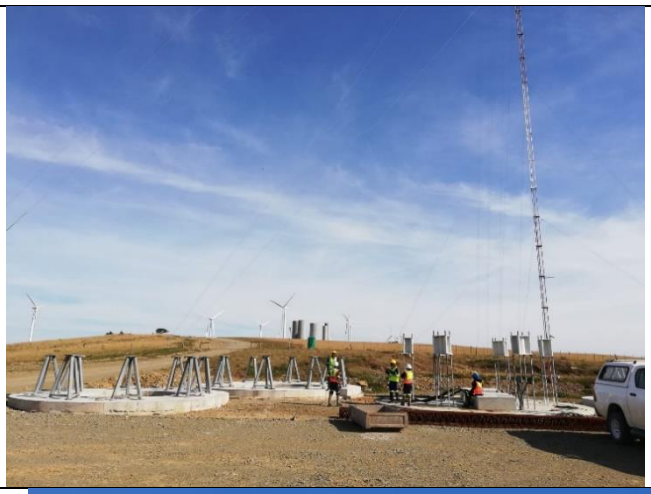
How are the number of turbines for the project determined?

Various wind turbine designs and layouts on the project sites are being considered by the project developer in order to maximise the generating capacity of the sites while minimising any negative environmental impacts. The final facility layouts, turbine capacities and models will be dependent on what is deemed suitable for the project sites in relation to, among other things, further studies of the wind regime (i.e seasonal), terrain, and environmental constraints and social sensitivities.

How are Wind Farms Constructed?

The length of the construction period for each of the wind farms is estimated to be approximately 30 months (2 ½ years). A turbine is designed to operate continuously, with low maintenance for 20 to 25 years. Direct and indirect job opportunities will be created during both construction and operation.

Photographs of the construction phase of a wind farm similar to those proposed



The specialist studies will be informed by existing information, field observations and input from the public participation process.

As an I&AP, your input is considered as an important part of the process, and we urge your involvement.

Survey Questionnaire

Questionnaire instructions

This assessment is being undertaken as part of the Social Impact Assessment for the Pofadder WEF 1, 2 and 3 Project, and you are invited to participate in an effort to gather information in this regard.

The questionnaire is divided into two sections. **Section A** is aimed at obtaining certain personal information to ensure that you are identifiable and contactable. This is necessary to analyse the opinions of people associated with various organisations within the vicinity of the Pofadder WEF 1, 2 and 3.

In **Section B** we ask short questions relating to the proposed project. As your opinion is vitally important to us, we request that you read **each** question **carefully** before you respond.

Section A

Complete **Section A** by filling in the requested information in the space provided. If you prefer to remain anonymous you are still welcome to comment and we will record these comments under **anonymous**.

1. Name.

First name		**Surname**	

2. Contact Details.

Phone number	
Mobile number	
Email address	
Postal address	

3. What organisation do you represent, and what is your designation in respect of this organisation?

Name of organisation	
Designation in respect of your affiliation indicated above	
Private citizen	

Section B

Instructions

This section consists of 3 brief statements relating to the Pofadder WEF 1,2 and 3 and seeks to solicit your opinion regarding this project.

Important
Please ensure that you clearly understand the situation concerning the Pofadder WEF 1,2 and 3 Project as explained above, and then **carefully** read each statement below and respond in the space provided.

1. How do you feel about having a wind energy project in your area?

Rate from 1 being least to 5 being most positive.				
1	2	3	4	5

2. Do you have any comments around having a new renewable project in your area?

3. Are there any suggestions that you would like to make?

Completed questionnaires should be emailed to nondumiso@savannahsa.com

When emailing PLEASE remember to attach this document to your email.

We guarantee the confidentiality of your information and assure you that it will only be used in respect of this Social Impact Assessment.

Thank you for your valued co-operation.

APPENDIX B :
EXTERNAL REVIEW LETTER

EXTERNAL PEER REVIEW

POFADDER 2 WIND ENERGY FACILITY

SOCIAL IMPACT ASSESSMENT

NOTHERN CAPE PROVINCE

JULY 2022

By

Tony Barbour

Tony Barbour
ENVIRONMENTAL CONSULTING AND RESEARCH

10 Firs Avenue, Claremont, 7708, South Africa
(Tel) 27-21-761 2355- (Fax) 27-21-761 2355- (Cell) 082 600 8266
(E-Mail) tbarbour@telkomsa.net

1.1 INTRODUCTION

Tony Barbour was appointed by Savannah Environmental to undertake an independent Peer Review of the Social Impact Assessment (SIA) Report for the proposed Pofadder 2 Wind Energy Facility (WEF), located ~ 30 km south-east of Pofadder in the Northern Cape Province of South Africa. This report contains the findings of the Peer Review of the SIA for the Pofadder 2 WEF prepared by Savannah Environmental (Savannah, July 2022).

1.2 EXPERIENCE WITH SOCIAL IMPACT ASSESSMENTS

Tony Barbour has undertaken in the region of 300 SIAs, including approximately 150 SIAs for renewable energy projects, including wind and solar energy facilities. Tony has also undertaken a number of SIAs for solar projects in the study area and is therefore familiar with the local socio-economic conditions and social issues affecting renewable energy projects in the area. In addition, he is the author of the Guidelines for undertaking SIAs as part of the EIA process commissioned by the Western Cape Provincial Environmental Authorities in 2007. These guidelines have been used throughout South Africa. A copy of Tony Barbour's CV is attached in Annexure A.

1.3 TERMS OF REFERENCE AND APPROACH

The terms of reference for the Peer Review were to review the SIA prepared by Savannah Environmental to ensure that the report met the accepted standards. The approach to the review involved:

- A review of the approach adopted in preparing the SIA Report.
- A review of the type and quality of information contained in the SIA Report.
- A review of the key findings contained in the SIA Report.
- Assessment of conformance of the Specialist Report with the requirements for Specialist Reports (Appendix 6, Regulation GNR 326 of 4 December 2014, as amended 7 April 2017).

1.4 FINDINGS OF PEER REVIEW

The findings of the Peer Review indicate that the SIA provides decision makers with the information required to identify the key socio-economic issues and risks associated with the proposed project. The findings of the Peer Review also support the findings of the SIA, namely that there are likely to be no fatal flaws.

Introduction and Approach
The approach adheres to and meets the requirements for SIAs. The SIA provides a detailed description of the proposed project and the location (Section 1). Section 2, Methodology and Approach (p6), provides an overview of the approach to the SIA, including the identification of key stakeholders and the collection and review of baseline information, and the impact assessment method (Table 2.3, p12). The limitations and assumptions are also clearly spelt out.

Policy and Baseline Socio-economic Information
Section 3, Legislation and Policy Review (p16), provides and overview of the relevant National, Provincial and Local polices and planning documents, while Section 4, Socio-

economic Profile (p26), provides baseline socio-economic information at a Provincial, Municipal, and local site level.

Assessment

Section 5, Assessment of Potential Social Impacts (p36), identifies, describes, and assess the potential social impacts associated with the construction (Section 5.1, p36) and operation (Section 5.2, p37) phases of the project. Based on the authors experience with wind projects, the relevant potential social impacts that are likely to have a bearing on the decision-making process have been identified and assessed. Section 5.5, Cumulative Impacts (p38), identifies and address the relevant potential cumulative impacts.

Table 5.1, 5.2, 5.3, 5.4 and 5.5 provide an assessment of the significance to the potential social impacts associated with the construction, operational, decommissioning, no go and cumulative impacts. The assessment ratings for the construction and operation phase impacts with enhancement and or mitigation measures are all regarded as accurate. The same finding applies to the assessment of cumulative impacts. Table 5.6 (p44) provides a summary of the impact ratings for the issues identified.

Conclusion

The key findings and recommendations (Section 6.1, p44) of the SIA as summarised in Table 5.6 (Construction, Operation and Cumulative), are supported by the findings of the Peer Review. The overall conclusion that "the proposed project and associated infrastructure will create a number of potential socio-economic opportunities and benefits and is unlikely to result in permanent damaging social impacts. From a social perspective it is concluded that the project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the project. Considering the findings of the report and potential for mitigation it is the reasoned opinion of the specialist that the project can be authorised from a social perspective", is also supported by the findings of the Peer Review.

The findings of the Peer Review also confirm that the SIA complies with the requirements for Specialist Reports (Appendix 6, GNR 326 of 4 December 2014, as amended 7 April 2017).

ANNEXURE A: CV

Tony Barbour
ENVIRONMENTAL CONSULTING AND RESEARCH

10 Firs Avenue, Claremont, 7708, South Africa
(Tel) 27-21-761 2355 - (Fax) 27-21-761 2355 - (Cell) 082 600 8266
(E-Mail) tbarbour@telkomsa.net

Tony Barbour's experience as an environmental consultant includes working for ten years as a consultant in the private sector followed by four years at the University of Cape Town's Environmental Evaluation Unit. He has worked as an independent consultant since 2004, with a key focus on Social Impact Assessment. His other areas of interest include Strategic Environmental Assessment and review work.

EDUCATION

- BSc (Geology and Economics) Rhodes (1984);
- B Economics (Honours) Rhodes (1985);
- MSc (Environmental Science), University of Cape Town (1992)

EMPLOYMENT RECORD

- Independent Consultant: November 2004 – current;
- University of Cape Town: August 1996-October 2004**:** Environmental Evaluation Unit (EEU), University of Cape Town. Senior Environmental Consultant and Researcher;
- Private sector: 1991-August 2000: 1991-1996**:** Ninham Shand Consulting (Now Aurecon, Cape Town). Senior Environmental Scientist; 1996-August 2000: Steffen, Robertson and Kirsten (SRK Consulting) – Associate Director, Manager Environmental Section, SRK Cape Town.

LECTURING

- University of Cape Town: Resource Economics; SEA and EIA (1991-2004);
- University of Cape Town: Social Impact Assessment (2004-current);
- Cape Technikon: Resource Economics and Waste Management (1994-1998);
- Peninsula Technikon: Resource Economics and Waste Management (1996-1998).

RELEVANT EXPERIENCE AND EXPERTISE

Tony Barbour has undertaken in the region of 240 SIA's, including SIA's for infrastructure projects, dams, pipelines, and roads. All of the SIAs include interacting with and liaising with affected communities. In addition he is the author of the Guidelines for undertaking SIA's as part of the EIA process commissioned by the Western Cape Provincial Environmental Authorities in 2007. These guidelines have been used throughout South Africa.

Tony was also the project manager for a study commissioned in 2005 by the then South African Department of Water Affairs and Forestry for the development of a Social Assessment and Development Framework. The aim of the framework was to enable the Department of Water Affairs and Forestry to identify, assess and manage social impacts associated with large infrastructure projects, such as dams. The study also included the development of guidelines for Social Impact Assessment, Conflict Management, Relocation and Resettlement and Monitoring and Evaluation.

Countries with work experience include South Africa, Namibia, Angola, Botswana, Zambia, Lesotho, Swaziland, Ghana, Nigeria, Senegal, Armenia, Mozambique, Mauritius, Kenya, Ethiopia, Oman, South Sudan, Sudan and Armenia.