ENVIRONMENTAL IMPACT ASSESSMENT

FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A 15 MW MERCHANT SOLAR PHOTOVOLTAIC PLANT ON A 20HA PIECE OF LAND ON PORTION 157 OF AUSSENKER FARMLANDS, IN AUSSENKER, KARAS REGION: NAMIBIA

ENVIRONMENTAL SCOPING REPORT

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Prepared by: Junior Baiano Industrial Consultants cc
Postal Address: PO Box 23537, Windhoek
Contact Person: Fredrich Nghiyolwa
Contact number: +264 (61) 219 773
Cell: +264 (0) 81 1472029
Email: JuniorB200581@gmail.com

Prepared for: SARE Aussenvalley Solar Park Phase 2 (Pty) Ltd
Postal Address: PO Box 90415
Contact Person: Lazarus Emvula
Contact number: +264 81 263 0222
Email: laz@sag.com.na

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Acronyms

TERMS	DEFINITION
BID	Background Information Document
CA	Competent Authorities
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
GDP	Gross Domestic Product
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
JBIC	Junior Baiano Industrial Consultants
MEFT: DEA	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs
PPE	Personal Protective Equipment

EXECUTIVE SUMMARY

Junior Baiano Industrial Consultants (JBIC) cc has been tasked by SARE Aussenvalley Solar Park Phase 2 (Pty) Ltd to carry out an Environmental Impact Assessment (EIA), formulate an Environmental Management Plan (EMP), and seek approval through the application for an Environmental Clearance Certificate. This certificate pertains to the proposed development and operation of a 15 MW Merchant Solar Photovoltaic Plant on a 20ha piece of land at portion 157 of Aussenker Farmlands, situated in Aussenker, Karas Region, Namibia. According to the Environmental Impact Assessment Regulations of 2012, the initiation of this project necessitates the application for an environmental clearance certificate due to specific activities associated with it.

Environmental Impacts

- Generation of waste during construction and operation.
- Impacts on vegetation and biodiversity through clearing of land during construction.
- Health and safety impacts during construction and operation.
- Surface and groundwater impacts during construction.

Social and Economic Impacts

- Improved energy supply.
- Creation of much needed employment opportunities
- Facilitation of local and national economic growth
- Utilization of an energy source (solar) is renewable and low emission. This contrasts with conventional fossil fuels that contribute to pollution and climate change.
- Reduction in foreign energy expenditures.
- An EMP has been developed to mitigate any anticipated possible impacts of the project to the environment.

Public Participation Process

Interested and Affected Parties were notified of the project through site notices and newspaper adverts. All relevant information regarding consultation is covered in Chapter 4 of this document and attached in Appendix A.

Recommendation

The Environmental Assessment findings suggest that the majority of identified impacts can be effectively managed through the recommended mitigation measures during both the construction and operation phases of the solar plant. If the suggestions outlined in this report and the Environmental Management Plan (EMP) are put into practice, the impacts' significance can be reduced to levels deemed reasonably acceptable in terms of standards and duration. It is advised that the proposed solar plant be granted an Environmental Clearance Certificate on the condition that the recommendations specified in this report and the EMP are duly executed.

1 CHAPTER ONE: BACKGROUND

1.1 INTRODUCTION

In response to the growing imperative for sustainable energy solutions and environmental responsibility, this Environmental Impact Assessment (EIA) report is presented for the proposed construction and operation of a 15 MW Merchant Solar Photovoltaic Plant at Portion 157 of Aussenker Farmlands in Aussenker, Karas Region, Namibia. The proposal aligns with Namibia's commitment to embracing renewable energy sources as a means to address the dual challenges of energy security and climate change.

Namibia, with its abundant sunlight and vast expanses of uninhabited land, stands at a pivotal juncture in the pursuit of sustainable energy alternatives. The need for clean, renewable energy sources has become increasingly urgent globally, driven by the escalating impacts of climate change and the imperative to transition away from fossil fuel dependence. As a semi-arid country, Namibia is particularly vulnerable to the adverse effects of climate change, including erratic weather patterns, water scarcity, and threats to agricultural productivity.

The introduction of solar energy, and specifically the development of a 15 MW Merchant Solar Photovoltaic Plant in the Aussenker Farmlands, holds immense significance in addressing these challenges. Solar energy, harnessed through photovoltaic technology, presents a viable and environmentally friendly solution to meet the rising energy demands of the region. The establishment of a solar plant at Portion 157 not only aligns with global efforts to reduce carbon emissions but also positions Namibia as a regional leader in embracing sustainable energy practices.

The advantages of solar energy in the Namibian context are multifaceted. Firstly, the country's geographical location, characterized by an average of over 300 days of sunshine annually, presents an unparalleled opportunity to harness solar power efficiently. The proposed solar plant at Aussenker is strategically positioned to capture and convert solar radiation into electricity, offering a reliable and consistent energy source.

Secondly, the development of solar energy infrastructure contributes significantly to energy diversification and security. By reducing dependence on conventional fossil fuels, Namibia can mitigate the economic and environmental risks associated with volatile global energy

markets. This diversification aligns with the national objective of achieving energy independence and resilience in the face of external energy supply uncertainties.

Furthermore, the construction and operation of a solar photovoltaic plant at Aussenker Farmlands will stimulate economic growth and job creation within the region. The project will not only provide employment opportunities during the construction phase but also foster a local workforce for ongoing plant operations and maintenance. This localized approach ensures that the benefits of renewable energy development extend beyond environmental considerations to encompass social and economic upliftment.

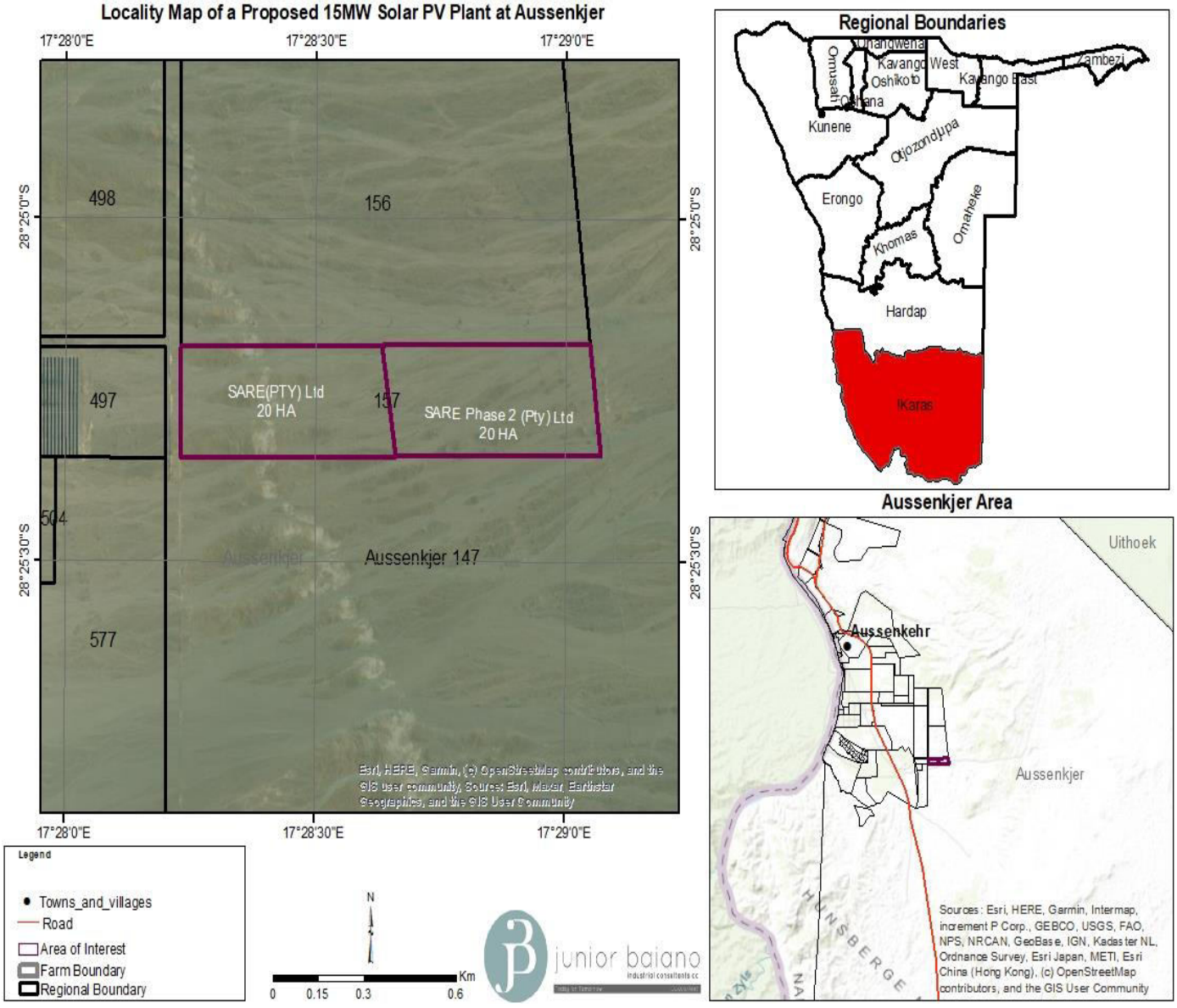
Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012) echoes the need of an Environmental Impact Assessment (EIA) for new projects (such as the proposed development) that are specified by the Act.

Non-compliance to legal obligations presents liabilities and it is in the wake of the need to attain sustainability that SARE Aussenvalley has opted to undertake an EIA for its proposed solar power plant. EIA is required to obtain an Environmental Clearance Certificate (ECC) from the Ministry of Environment and Tourism (MET) before the project can proceed. In this context the company has set out to conduct the Environmental Impact Assessment (EIA) for its upgrade activities.

The EIA is the official appraisal process to identify, predict, evaluate and justify the ecological, social and related biophysical impacts of the project on both the environment and, affected and interested stakeholders. It provides insight on alternatives and measures to be adopted to prevent or mitigate any impacts/risks that may ensue from the project and its associated activities. As per the requirements of the Environmental Management Act No. 7 of 2007, SARE Aussenvalley has appointed JBIC to conduct the EIA and develop an Environmental Management Plan (EMP) for the proposed project. In this respect, this document forms part of the application to be made to the DEA’s office for an ECC for the proposed project, in accordance with the guidelines an statutes of the Environmental Management Act No.7 of 2007 and the environmental impacts regulations (GN 30 in GG 4878 of 6 February 2012).

1.2 PROJECT LOCATION

The project site is located on portion 157 of Aussenker Farmlands, in Aussenker, Karas region, Namibia. The exact project



site is depicted below.

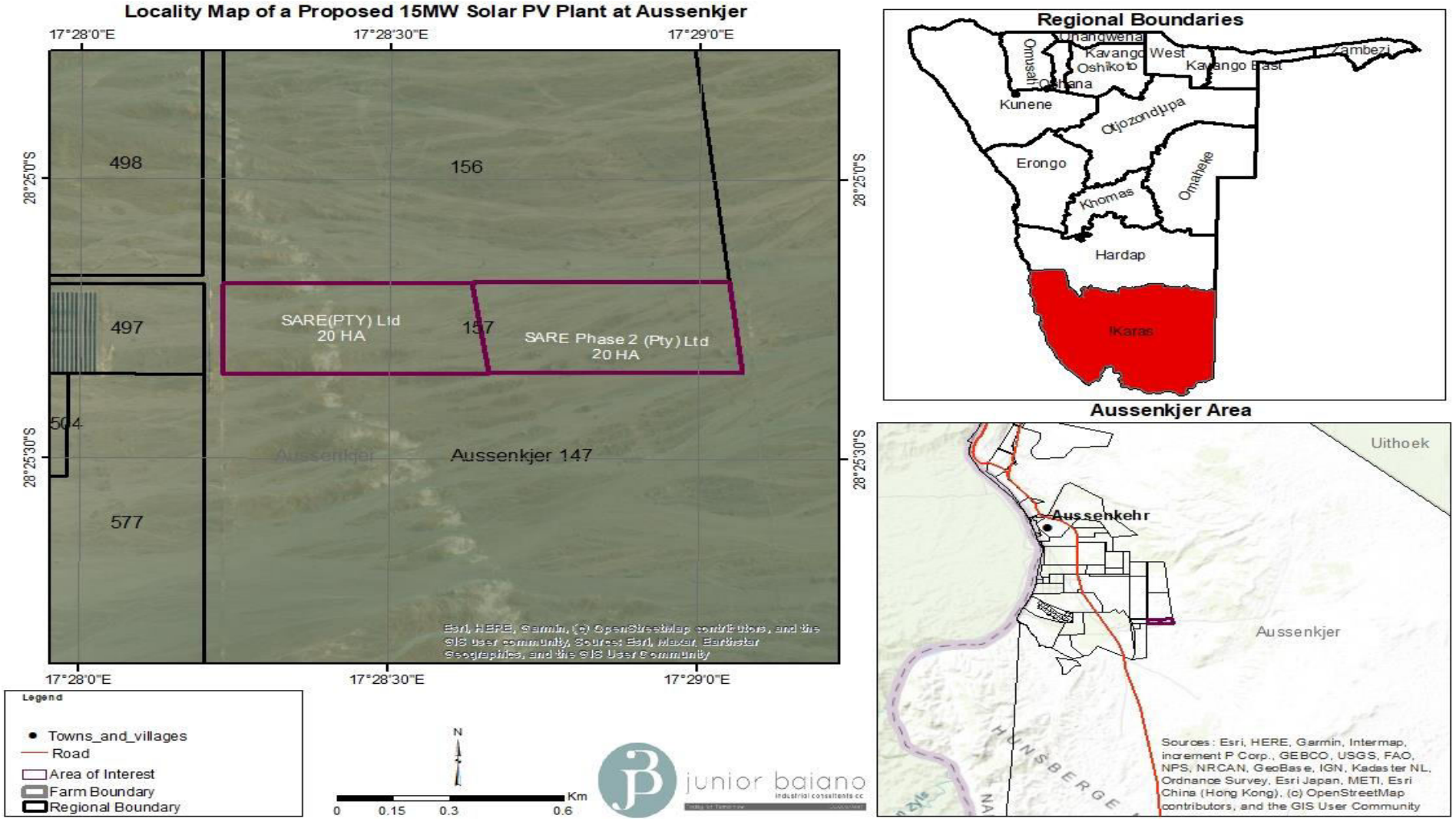


Figure 1-1:Locality map

1.3 PROJECT OVERVIEW

This project entails the transformation of bare land to accommodate the proposed Solar Power plant, associated infrastructure and services. The proponent intends to develop approximately 35 000 individual solar energy producing panels that will sit on approximately 20 hectares piece of land. The Company anticipates that this solar farm will produce approximately 15MW to be connected to the national transmission power grid of NamPower in close proximity to the PV plant.

The infrastructure proposed for the entire Solar Power Plant (project) includes but is not limited to the following:

- PV Modules.
- Side-of-Pole Mount for Solar Panel or PV Module.
- Administration Block.
- Storage room.
- Security Room.
- Transmission line connected to NamPower.

The project works involve the construction and operation of a solar PV plant which includes:

- Planning and Design of Project Work – this compasses land acquisition and registration; preliminary site investigations e.g. geotechnical assessments and topographical surveys; permit applications; preparation of site plans/drawings and application of the appropriate approvals from the relevant regulatory authorities; assessment of baseline conditions to determine supply and demand for required project services; carry out EIA and obtain the appropriate approvals; etc.
- Site Preparation – this entails grading, landscaping, building roads and siding of project areas in order to make the sites free of obstruction prior to construction. It may also involve utilization of heavy machinery/equipment to fully prepare the landscape. This includes physically removing vegetation, any pre-existing concrete foundations, etc. By doing this, the sites are prepared for new concrete foundations and other needed site work.
- Building Foundation - once the site landscaping is fully prepared, getting the project areas mapped out for the foundation is the next critical phase before items can be delivered. The breakdown of the foundation process encompasses location of conduits into concrete shelters, placing rock in foundation bed to provide a firm surface

for concrete, placing of rebar in framed areas to add extra strength for poured concrete; etc.

- Transportation, Logistics and Construction - site preparation complete and foundation in place, the next important step is preparing for transportation, logistics and construction of the solar plant, transmission lines and other associated infrastructure. This takes into account evaluating all site conditions to make sure they are conducive for the weight of cranes and trucks; planning for transporting very heavy pieces of equipment; execution and control of the procurement; movement and stationing of personnel, material and other resources; etc.
- Electrical and Grounding - it is necessary to determine and install all necessary electrical and grounding materials needed to power the project areas.
- Operation of the solar power plant.

1.4 ACCESSIBILITY

The road infrastructure in Namibia, including the Karas Region, has been a focus of development. The B1 and B3 national roads are major routes connecting various parts of the country, and they also pass through the Karas Region.

Specific roads connecting towns and settlements within the Karas Region would vary in terms of condition, but the government has been working on maintaining and upgrading road networks. Telecommunications in Namibia, including the Karas Region, have seen improvements. Mobile networks and internet services are available, and major towns are likely to have good connectivity. Telecom Namibia and MTC are key players in the country's telecommunications sector, providing services such as landline and mobile communication, as well as internet services.

1.5 INFRASTRUCTURE AND SERVICES

A borehole will be drilled on site as the project source of water. Soak away-based ablution facilities are to be used on site.

1.6 NEED AND DESIRABILITY

With an average of ten hours of sunshine per day, Namibia is one of the world's sunniest countries. As shown in the graph below, it has enormous potential for solar energy yet, 60% of the country's energy is imported from neighboring countries and 40% of its population is disconnected from the grid (Climate Partner, 2022).

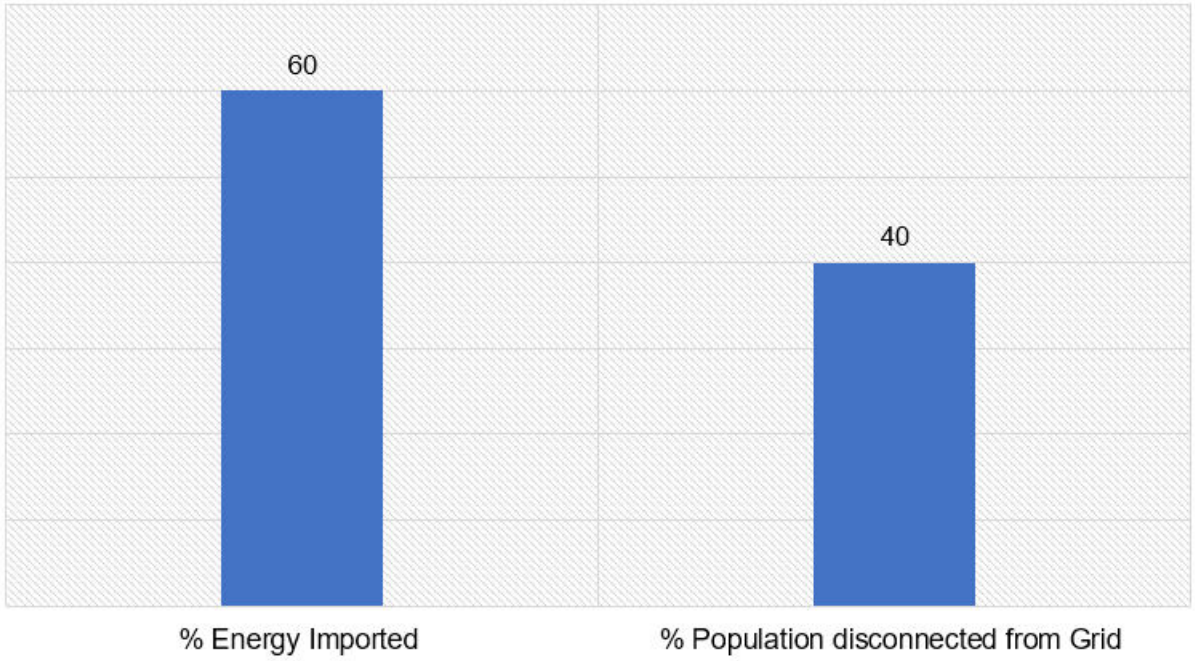


Figure 1-2: % of Energy Import and Disconnected Population

Nonetheless, Namibia has ambitious goals. The Harambee Prosperity Plan (HPPII) articulates ambitious plans to develop green and blue economies in the country. Namibia is uniquely positioned to become the renewable energy hub of the continent and is determined to play a leading role in illustrating how environmentally sustainable business practices can be profitable and transformative undertakings. By 2030, Namibia aims to produce 70% of its energy from renewable energy sources, with independent energy producers feeding renewable energy into its national grid (WEF, 2021).

The 15MW Solar PV Plant, is thus a major step in addressing the objectives of the developmental plans and targets of the Namibian government. The project will helping increase the proportion of renewable energy sources in Namibia's energy mix and improve regional and national supply.

1.7 PROJECT ALTERNATIVES

The project will not be implemented if the No-Go option is selected. The no-project alternative would mean that the various potential impacts/risks emanating from the proposed project would not be experienced. Thus the current uses and value and other potential land uses of the site are likely to be retained.

In addition there would no increased pressure on resources such as water which are already under strain. There also would be no increased chances of pollution and other potential negative impacts that would emanate from project activities.

If the project is implemented, it is anticipated that the project will have the following benefits

- Improved energy supply
- Creation of much needed employment opportunities
- Facilitation of local and national economic growth
- Utilization of an energy source (solar) is renewable and low emission. This contrasts with conventional fossil fuels that contribute to pollution and climate change.
- Reduction in foreign energy expenditures.

These benefits will not be realised if the project does not take place. With the current needs in green energy in the region and nation, it is imperative that the solar plant be established. The non-development of the proposed project will furthermore impede economic development and socio-economic progress.

Due to the project's numerous environmental and socio-economic benefits, and that the identified environmental impacts can be suitably mitigated it has been determined that the No Go option can be eliminated. Should the Competent Authorities (CA) refuse the authorisation of the proposed project, the 'No Go' option will be "implemented" and the status quo of the site will remain intact - leaving the site in its present state.

Table 1-1: Other Alternative Considerations

Item	Description	Alternatives	Comments
1.	Siting	• Current site	The project site is the only area accessible and authorized for the project.
2.	Transportation	• Road • Rail	Given the location of the project road and rail are the most cost-effective means of transport.
3.	Solid Waste Disposal	• Construction of a solid waste disposal site at the project site • Disposal of solid waste off site	Construction of a waste disposal on site.

Item	Description	Alternatives	Comments
4.	Water and Sanitation	• Drilling a Borehole on site • Soak away system	A borehole will be drilled on site as a source of water. If this is not adequate the project may be connected to the town council Soak away system is to be used ablution facilities.
5.	Energy	• Electricity • Solar	Considering investment costs it is cost effective to use electrical energy as an energy source in the initial stages of the project. Solar energy will be used when the project is in its operational phase.

1.7.1 Conclusion

It is recommended that the project goes ahead, with the construction and operation of a 15 MW Merchant Solar Photovoltaic plant at portion 157 of Aussenker Farmlands, in Aussenker, Karas Region, Namibia as a viable option as it is a cost effective and sustainable land use option.

2 CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 INTRODUCTION

This EIA Report for the solar plant has been prepared in reference to identified Namibian laws and regulations that impinge on the project throughout all its phases. Legislation is one of the most important instruments of government that ensures the following:

- Acceptable pollution control and waste management
- Conservation and utilisation of resources
- Sustainable land-use planning and regulation
- Safe and healthy workplace environments
- Determination amongst others things of the rights and responsibilities of individuals and authorities to whom the legislation applies.

The international and national laws, agreements and treaties that govern the social and environmental issues of the project are outlined in the following sub-section. The sub-section take into account brief summarises of selected legislation; it do not seek to provide comprehensive details of all legal obligations that apply to the project but rather an overview.

2.2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The pursuit of sustainability is guided by a sound legislative framework. In this section, relevant legal instruments as well as their relevant provisions have been surveyed. An explanation is provided regarding how these provisions apply to this project.

Table 2-1: Legal Compliance

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95(i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish the sustainable objectives which include: • Guarding against overutilization of biological natural resources, • Limiting over-exploitation of non-renewable resources, • Ensuring ecosystem functionality, • Maintain biological diversity.	Through implementation of the environmental management plan the proposed development will be in conformant to the constitution in terms of environmental management and sustainability, through bringing development in an environmentally sensitive way.
Vision 2030 and National Development Plans	Namibia's overall Development ambitions are articulated in the Nations Vision 2030. At the operational level, five-yearly national development plans (NDP's) are prepared	The proposed energy generation project, is an important element in the

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.	industrialisation of the country as well as FDIs in Namibia.
Environmental Assessment Policy of Namibia 1994	The Environmental Assessment Policy of Namibia requires that all projects, policies, Programmes, and plans that have detrimental effect on the environment must be accompanied by an EIA. The policy provides a definition to the term “Environment” broadly interpreted to include biophysical, social, economic, cultural, historical and political components and provides reference to the inclusion of alternatives in all projects, policies, programmes and plans.	The construction and operation of the solar farm and transmission line will only commence after being awarded an environmental clearance certificate, thus by abiding to the requirements of the Environmental Assessment Policy of Namibia. The EIA and EMP will cater for the sustainable management of biophysical environment.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Environmental Management Act No. 07 of 2007	The Act aims at • Promoting the sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment; • To provide for a process of assessment and control of projects which may have significant effects on the environment; The Act gives legislative effect to the Environmental Impact Assessment Policy. Moreover, the act also provides procedure for adequate public participation during the environmental assessment process.	This document is compiled in a nature that project implementation is in line with the objectives of the EMA. EIA guiding procedures developed by MET were also used in the course of this project.
Electricity Act 4 of 2007	Requires that any generation and or distribution complies with laws relating to health, safety and environmental standards (s 18(4)(b)	Obliges SARE Aussenvalley to comply with all relevant provisions of the EMA and its regulations.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	In the event that exemption from acquiring a license is granted, the Minister may impose conditions relating to public health safety or the protection of the environment.	
The Atomic Energy and Radiation Protection Act, Act 5 of 2005:	Provides for the adequate protection of the environment and of people against the harmful effects of radiation by controlling and regulating the production, processing, handling, use, holding, storage, transport and disposal of radiation sources and radioactive materials, and controlling and regulating prescribed non-ionising radiation sources according to the standards set out by the ICNIRP.	Justifies the need for assessing the impact of electromagnetic radiation from the power line, on the nearby settlements.
"Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300GHz)" (April 1998 developed by the	Provides international standards and guidelines for limiting the adverse effects of non-ionising radiation on human health and well-being, and, where appropriate, provides scientifically based advice on non-ionising radiation protection including the provision of guidelines on limiting exposure.	Justifies the need for assessing the impact of electromagnetic radiation from the power line, on the nearby residents.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
International Commission on Non-Ionizing Radiation Protection (ICNIRP))		
Public Health Act (No. 36 of 1919)	Under this act, in section 119: "No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	• The project proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected. • Personal protective equipment shall be provided for employees in construction. • The development shall follow requirements and specification in relation to water supply and sewerage handling so as not to threaten public health of future residents on this piece of land.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Soil Conservation Act 76 of 1969	The objectives of this Act are to: • Make provisions for the combating and prevention of soil erosion, • Promote the conservation, protection and improvement of the soil, vegetation, sources and resources of the Republic.	The project will have a rather localized impact on soils and on the soil through clearance for PV panel stands and powerline poles. Soil protection measures will be employed and preservation of trees as much as possible.
Nature Conservation Ordinance 1996	To consolidate and amend the laws relating to the conservation of nature; the establishment of game parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.	The proposed project implementation is not located in any known or demarcated conservation area, national park or unique environments. The project site was selected with this ordinance in mind to ensure that Namibian nature is conserved.
Protected Areas and Wildlife Management Bill	This bill, when it comes into force, will replace the Nature Conservation Ordinance 4 of 1975. The bill recognizes that biological diversity must be maintained, and where	Environmental recommendations and considerations on this project has ensured that the proposed activities will

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	necessary, rehabilitated and that essential ecological processes and life support systems be maintained. It protects all indigenous species and control the exploitation of all plants and wildlife.	not fall within the boundaries of any protected area and that the project will not affect heavily endangered vegetation and animals on its site.
Forest Act, 2001 (Act No. 12 of 2001)	The Act gives provision for the protection of various plant species through the Ministry of Agriculture, Water and Forestry (MAWF), Directorate of Forestry).	• Land clearing of an extensive piece of land will be done upon approval from the Directorate of Forestry. • The proponent will also have to ensure that there is no indiscriminate cutting down of trees during construction and operation • The proposed site is sparsely vegetated with white thorn tree species, which are not threatened or protected.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
National Rangeland Policy and Strategy, 2012	The policy aims at enabling resource users (farmers and managers) to manage their rangeland resources in a sustainable manner and sustainable in that they are economically viable, socially acceptable, environmentally friendly and politically conducive.	This proposed project will ensure that the local community benefits both economically and socially from the project, this in line with the recently declared Harambee Prosperity Plan and NDP 4&5.
National Biodiversity Strategy and Action Plan (NBSAP2)	The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia putting together management of matters to do with ecosystems protection, biosafety, biosystematics protection on both terrestrial and aquatic systems.	• The project proponent has been advised by JBIC and recognises the need for ecosystems protection to manage the changing climatic environment. • This project is one of the drivers to reduce the rate of global environmental change given its contribution, to decreased use of burning fossil fuels for energy generation.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
National Policy on Climate Change for Namibia, 2010	In harmony with the findings of the IPCC over time and the Earth Summits held annually, the policy seeks to outline a coherent, transparent and inclusive framework on climate risk management in accordance with Namibia's national development agenda, legal framework, and in recognition of environmental constraints and vulnerability. Furthermore, the policy pursues the strengthening of national capacities to reduce climate change risk and build resilience for any climate change shocks.	Solar energy harnessing technologies are a positive impact to fighting climate change, thus this development is a positive step towards climate smart energy generation and environmental sustainability.
Wetland Policy, 2004	The policy provides a platform for the conservation and wise use of wetlands, thus promoting inter-generational equity regarding wetland resource utilization. Furthermore, it facilitates the Nation's efforts to meet its commitments as a signatory to the International Convention on Wetlands (Ramsar) and other Multinational Environmental Agreements (MEA's).	• In compliance to this Policy, the development will ensure a standard environmental planning such that it does not affect any wetlands within its locale through recognition of wetlands to promote the

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
		conservation and wise utilization of wetlands resources. • Runoff from the project site is to be controlled so as to prevent pollution of surrounding water bodies.
Water Resources Management Act, 2013 (Act No. 11 of 2013)	This Act provides for the management, protection, development, use and conservation of water resources. This also forms the regulation and monitoring of water resources.	Water supply will be obtained from either boreholes or any other identified sources. Appropriate water abstraction permits are to be obtained before is drawn from the identified water sources.
National Heritage Act 27 of 2004	Heritage resources to be conserved in development.	• During the project implementation as soon as objects of cultural and heritage interests are observed such as graves, artefacts and any other object believed to be order than 50 years, all measures will be taken protect these objects until the

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
		National Heritage Council of Namibia have been informed, and approval to proceed with the operations granted accordingly by the Council.
National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	"No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: (a) any meteorite or fossil; or (b) any drawing or painting on stone or a petroglyph known or commonly believed to have been executed by any people who inhabited or visited Namibia before the year 1900 AD; or (c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph (b); or	The proposed site of development is not within any known monument site both movable or immovable as specified in the Act, however in such an instance that any material or sites or archeologic importance are identified, it will be the responsibility of the developer to take the required route and notify the relevant commission.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
	(d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or (e) any other archaeological or palaeontological finds, material or object; except under the authority of and in accordance with a permit issued under this section.	
Pollution Control and Waste Management Bill	This bill has not come into force. Amongst others, the bill aims to "prevent and regulate the discharge of pollutants to the air, water and land" Of particular reference to the Project is: Section 21 "(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse." Section 55 "(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment."	To control air, water and land pollution as agitated by the Act the proponent will ensure that the project site will have approved drainage on site as well as standard conservancy tanks that do not threaten public health, adding on an integrated pollution management strategy following the EMP provided herein.

LEGISLATION/POLICY/ GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
Convection on Biological Diversity (CBD)	Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.	The project will preserve flora and fauna species as part of the project plans.
United Nations Convection to combat Desertification	Namibia is bound to prevent excessive land degradation that may threaten livelihoods.	It will be the responsibility of the proponent to conserve vegetation on and around the area, to avoid encroachment of the desert environs in the area.

3 CHAPTER THREE: RECEIVING ENVIRONMENT

3.1 SOCIO-ECONOMIC

The proposed exploration project is located in the Bethanie district in Namibia's Karas region. The Karas region is the southernmost, largest, and least densely populated of the 14 regions of Namibia; its capital is Keetmanshoop.

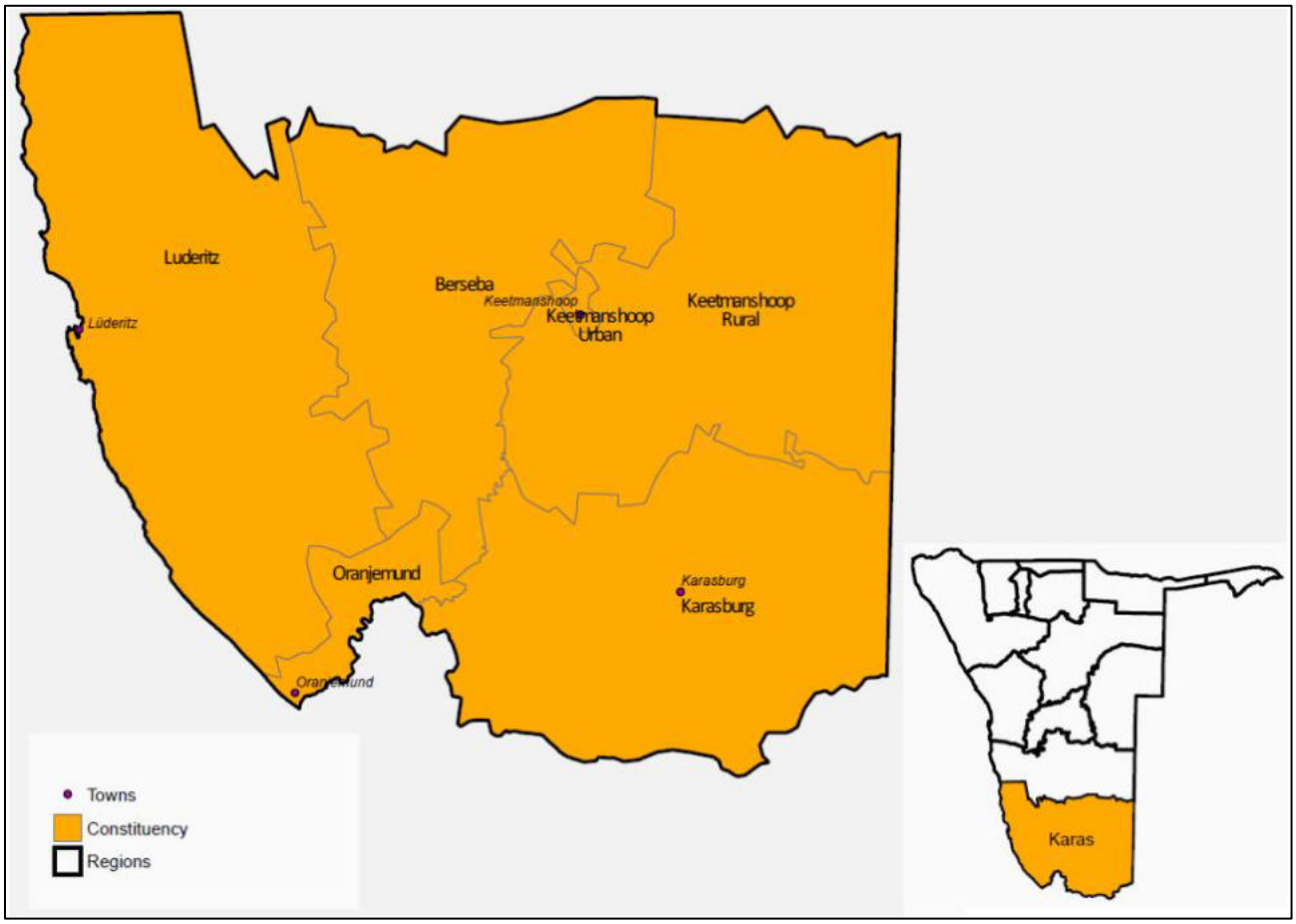


Figure 3-1: Karas Region and its constituency

3.1.1 Local Economy and Infrastructure

The region is predominantly a small stock-farming area, consisting mostly of animals such as sheep or goats. Game farming and irrigation farming along the Naute Dam and the Orange River have gained significantly in importance.

Notable characteristics of the region include the harbour town of Lüderitz and its fishing and boat-building industry, the diamond areas along the coast—both on and off shore—with Oranjemund as the main centre, mining enterprises in the southern part of Namibia such as the Haib mine, (Klein Karas area, Rosh Pinah), the Kudu Gas field in the Atlantic Ocean near Lüderitz, and small-scale industries in Lüderitz and Keetmanshoop.

The Hot Water Springs at Ai-Ais, the Hot Water Springs in Warmbad, the Kokerboom Forest near Keetmanshoop, the Fish River Canyon (the second-largest in the world), the Brukaros Mountain (a former volcano) near Berseba, the coastal town Lüderitz, and several guest and game farms have become important tourist attractions. The tourism industry has the potential for further expansion.

The economic growth potential of the area is considerable but needs an intensive general development policy. It is a profitable tax-generating area, which predominantly comes from diamond mining for the central government.

The main railway line and two main trunk roads give access to South Africa. Keetmanshoop is considered as the capital of the south and has direct air, railway, and road links with Windhoek. Its airport is of international standards and suitable for international air traffic. There is an airfield at Kolmanskop near Lüderitz. Well-developed landing facilities also exist at Oranjemund. Karas has 49 schools with a total of 20,110 pupils.

Extrapolating from the national unemployment statistics, the constituency has an unemployment rate of 33.40% and youth unemployment rate of 46.10% (Namibia Central Bureau of Statistics, 2019). This shown in the figure below.

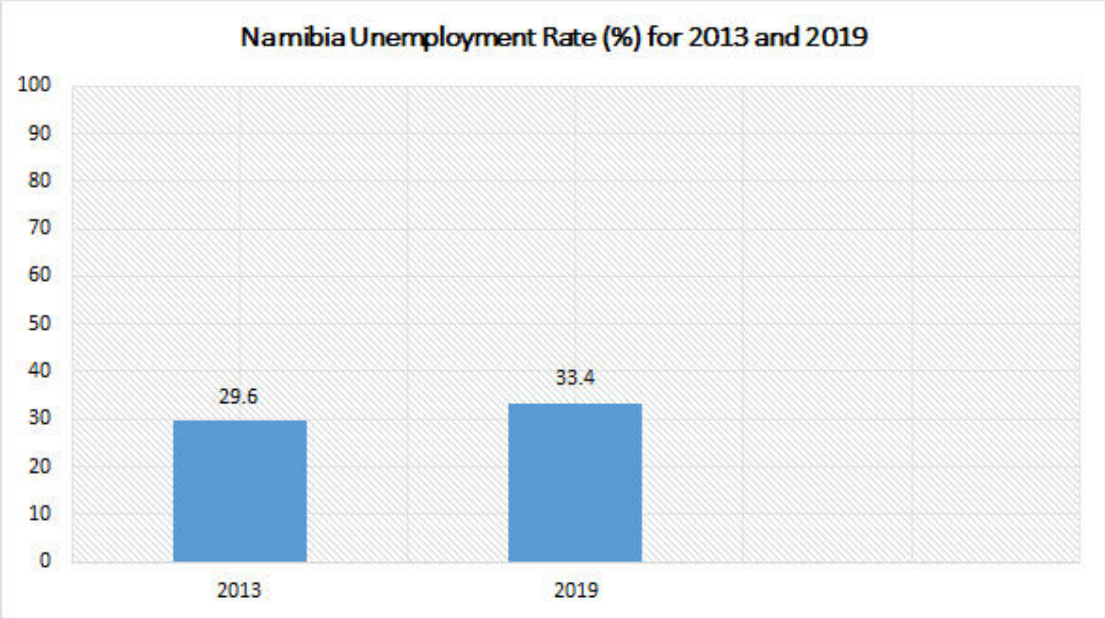


Figure 3-2: Namibia Unemployment Rate and Youth Unemployment Rate

The project will support the district's need for employment as well as the expansion of the local economy. Numerous employment opportunities are to be created for work personnel throughout the project phases. In addition other forms of employment are likely to result from

spillover effects, through indirect services such as supply of raw materials, equipment, machinery, etc.

3.2 CLIMATE

The average annual rainfall varies from less than 50 mm in the south west (Namib Desert) to 250 mm in the northeast of the region. Not only is the average rainfall low, rainfall is also very unpredictable and localized. Western Karas region is part of a winter rainfall area, and is characterized by a climate regime that is quite different to the rest of the country. Notably this rainfall regime has led to the development of the distinct succulent Karoo biome, which is a global biodiversity hot spot of high conservation value.

Extremely high maximum temperatures above 360°C are recorded for this region – overall among the highest in Namibia. At the other extreme, the coldest average minimum temperatures are recorded for this region at below 20ºC. People in Karas Region mainly practice small-stock farming with sheep, goats and cattle.

The nearest town is Aus, 86km away from project site. The climate around Aus is a typical desert climate with warm to hot days and cooler nights and little rainfall. Summer temperatures often rise above 40°C while winter temperatures are typically 20° C to 25° C during the day but can drop below 0°C at night. Rainfall can occur in all seasons, but is predominant in the summer months of January to March. The average annual rainfall is around 150 mm.

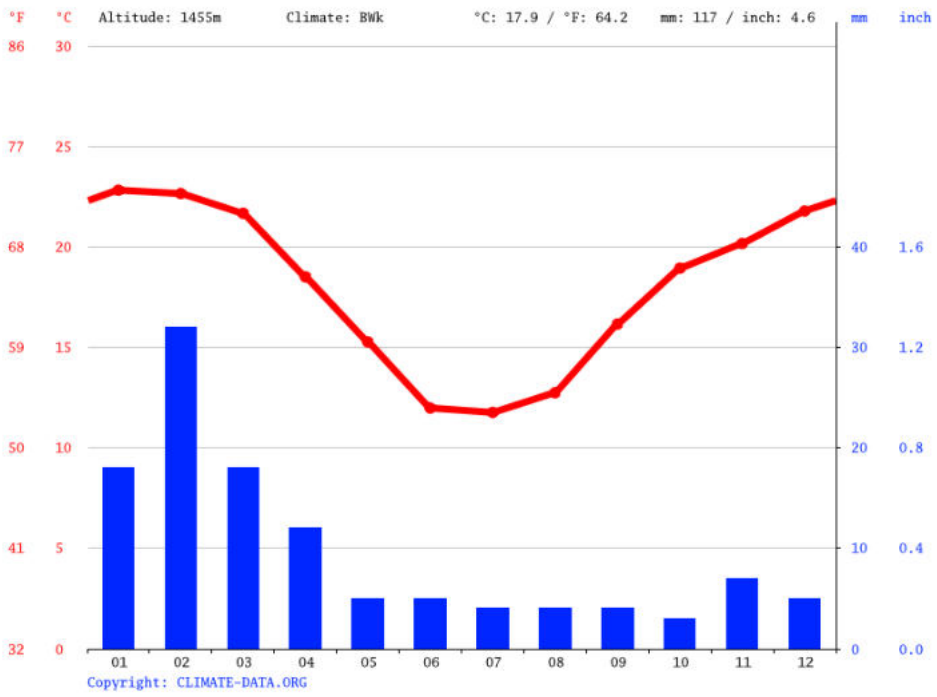


Figure 3-3: Karas Climatic Graph

Source: Climate-data.org, 2022

3.3 FLORA AND FAUNA

The project area is situated in the Karas Region, which boasts a unique array of flora and fauna, adapted to the region's arid climate and distinct ecological conditions. This region, characterized by vast desert landscapes and semi-arid savannas, supports a diverse and resilient ecosystem. The flora and fauna of the Karas Region reflect the remarkable adaptations of life to the challenges posed by aridity, with both plant and animal species showcasing remarkable strategies for survival.

3.3.1 Flora

The plant life in and around the project area is defined by a myriad of desert-adapted species, each contributing to the region's ecological richness. One of the most iconic plants in this arid landscape is the Welwitschia mirabilis, often regarded as a living fossil. This unique plant species has adapted to survive in extreme conditions, with its long, strap-like leaves and a shallow root system that allows it to capture water efficiently. Additionally, *Stipagrostis spp*., commonly known as Bushman Grass, represents a crucial component of the region's vegetation cover. These drought-resistant grass species play a significant role in stabilizing the soil and providing sustenance to herbivores.

Succulents and endemic species further contribute to the biodiversity of the Karas Region. The *Aloe dichotoma*, commonly known as the Quiver Tree, stands as a testament to nature's adaptability. This succulent plant, with its distinctive forked branches, is well-adapted to store water in its tissues, enabling it to survive prolonged periods of drought. The *Tylecodon schaeferianus*, an endemic succulent species, displays unique adaptations such as fleshy leaves, which aid in water conservation. These plants collectively create a visually stunning and ecologically vital landscape, contributing to the region's overall biological diversity.

Riparian vegetation along riverbanks is another integral aspect of the Karas Region's flora. The *Acacia karroo*, commonly known as Sweet Thorn, is a prevalent species in these areas, providing essential shade and serving as a valuable source of forage for wildlife. The *Ziziphus mucronata*, or Buffalo Thorn, is another riparian species that not only contributes to the biodiversity of the region but also holds cultural significance and medicinal properties.

3.3.2 Fauna

The Karas Region supports a diverse range of mammalian species, each uniquely adapted to the challenges of the desert environment. The Oryx gazella, or Gemsbok, is a prominent

antelope species in the region, recognized for its distinctive long horns and remarkable ability to thrive in arid landscapes. Another iconic antelope species is the Antidorcas marsupialis, commonly known as the Springbok. These small, agile antelopes form herds across the semi-arid plains, displaying their adaptability to the challenging conditions of the Karas Region.

Avian life in and around the project area is equally diverse, with various bird species thriving in different habitats. The Struthio camelus, or Ostrich, is often spotted in the arid savannas, showcasing its adaptability as a flightless bird in the harsh desert conditions. The Corvus albus, or Pied Crow, is a common sight in both urban and rural areas, demonstrating its ability to adapt to various environments. These birds contribute to the overall biodiversity of the region and play crucial roles in ecological balance.

Reptiles, with their remarkable adaptations to extreme conditions, further enrich the fauna of the Karas Region. The Meroles anchietae, also known as Anchieta's Desert Lizard, is an endemic species found in the Namib Desert. This lizard has evolved to withstand the extreme temperatures of the region, showcasing intricate patterns of adaptation. On the other end of the spectrum, the Bitis arietans, or Puff Adder, is a venomous snake species found in various habitats, including the desert landscapes of the Karas Region.

3.4 GEOLOGY AND HYDROLOGY

The Karas Region in Namibia offers a rich tapestry of geological and hydrological features, each contributing to the unique character of this arid landscape. Understanding the geological foundation and hydrological dynamics of the region provides insights into its environmental diversity and resource management challenges.

3.4.1 Geology

At the heart of the Karas Region lies a geological narrative shaped by ancient processes and tectonic events. Part of the expansive Kalahari Basin, the region is predominantly characterized by sedimentary rocks, including sandstones and shales. These rock formations stand as archives of geological history, reflecting deposition and compaction over millions of years. The presence of granitic intrusions adds an additional layer of complexity to the geological composition, highlighting the region's diverse geological heritage.

The topography of the Karas Region is a testament to the geological forces that have sculpted its surface. Vast plains, isolated mountain ranges such as the Tiras Mountains, and elevated surfaces define the landscape. The Namaqualand Plateau in the north, with its

escarpments, contributes to the region's topographical diversity. Iconic landforms, including the Fish River Canyon, showcase the erosional processes that have played out over geological time scales. This varied topography underscores the geological richness that defines the Karas Region.

Mining activities in the Karas Region are intricately tied to its mineral wealth. Diamonds, gemstones, and semi-precious stones are coveted resources found in abundance, making Namibia a key player in the global gemstone market. Beyond these, deposits of uranium and copper further contribute to the region's mineral richness. The geological endowment of the Karas Region not only fuels economic activities but also demands responsible resource management to balance economic gains with environmental preservation.

3.4.2 Hydrology

Hydrologically, the Karas Region faces challenges associated with its arid climate. Ephemeral rivers and underground aquifers are vital water sources. The Fish River, an ephemeral river, plays a crucial role in supporting local ecosystems and providing water during sporadic rainfall events. Aquifers, embedded in sedimentary rocks, serve as essential groundwater reservoirs, supporting agriculture and human settlements. Understanding these water sources is fundamental to sustainable water management in the region.

The dynamics of groundwater in the Karas Region are intricately linked to its geological composition. Permeable sedimentary rocks facilitate the storage and movement of groundwater, creating important aquifers. However, the extraction of groundwater for various purposes necessitates careful management to prevent over-extraction and depletion. The delicate balance between groundwater availability and utilization requires nuanced approaches to ensure long-term sustainability.

Water scarcity is a significant concern in the Karas Region, given its arid climate and limited surface water availability. Sustainable water management practices, including rainwater harvesting and responsible groundwater use, are crucial for addressing water scarcity issues. Conservation efforts are imperative to strike a balance between human needs, agricultural demands, and the preservation of fragile ecosystems dependent on these water sources. The sporadic nature of rainfall events necessitates adaptive strategies for effective water resource management.

4 CHAPER FOUR: PUBLIC CONSULTATION

4.1 OVERVIEW

The public consultation process forms an important component of the Environmental Assessment process. It is defined in the EIA Regulations (2012), as a "*process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters*" (S1). Section 21 of the Regulations details steps to be taken during a given public consultation process and these have been used in guiding the process.

Formal public involvement has taken place via public consultations and focal meetings, newspaper announcements to inform the public that such a large-scale project is under consideration. The public consultation process has been guided by the requirements of Environmental Management Act (EMA) No. 7 of 2007 and the process has been conducted in terms of regulation 7(1) as well as in terms of the EMA Regulations of GN 30 of 6 February 2012.

Its overriding goals have been to ensure transparency in decision making and to.

- ✓ Ensure stakeholder concerns are incorporated in project design and planning;
- ✓ Increase public awareness and understanding of the project and
- ✓ Enhance positive development initiatives through the direct involvement of affected people.

The objective of the public participation is to build credibility through instilling integrity and of conducting the EIA, Educate the stakeholders on the process to be undertaken and opportunities for their involvement and build stakeholders by establishing an agreed framework accordingly. This requires accessible, fair, transparent and constructive participation at every stage of process. Inform stakeholders on the proposed project and associate issues, impacts and mitigation and using the most effective manner to disseminate information.

In this section of the report, the results of consultations with various classes of stakeholders are summarized. The results of consultations with other stakeholders and community members who took part in this EIA are attached as Appendices.

The consultation was facilitated through the following means:

- ❖ A Background Information Document (BID) containing the project description, the EIA process and an invitation to participate was shared with stakeholders and community members.

- ❖ Invitation to participate notices were published in the local newspapers (e.g. Confidante) as shown in Table 4.1 below and Appendix A of this document.
- ❖ Announcement of EIA process verbally in the common public meeting points.
- ❖ Placement of a public notice at the project site and town centre.

Table 4-1: Details of public notification of the EIA study

Method	Area of Distribution	Language	Date Placed
The Confidante	Country Wide	English	06 October 2023 13 October 2023
The Village	Country Wide	English	06 October 2023 13October 2023
Site notices	Project site	English	09–11 October 2023
Public Meeting	Aussenker Community Centre	English,	12th October 2023

The photos below show the public consultation notice that was placed for project. Also shown are photos that were taken during the site visits as well as the public meeting.

Public Meeting Notice at Shoprite Keetmanshoop

Public Meeting Notice at MultiSave_Keetmanshoop

Figure 4-1:EIA Public Meeting Public Notice in Aussenker (at project site & in and around the project)

Figure 4-2: Site Visits

Figure 4-3: Public Meeting

- ✓ *Key Stakeholder Engagement Meeting*

A public meeting was organised on the 12th of October 2023 14h00pm at Aussenker Community Centre. Proof of public consultation is given in Appendix A of this document as well the attendance register explaining the project and the EIA study. Given below are the details of the meeting which was held:

- ✓ *Identification of Interested and Affected Parties (I&APs)*

The EIA team identified and consulted the following I&APs & key stakeholders for the proposed project:

- ❖ Landholders/Farm Owners
- ❖ NAMPOWER
- ❖ Community Members.

Other I&APs were allowed to register to the EIA team and compiled a database containing their names and correspondence details. The registration was accomplished over a period of 14 days.

- ✓ *Consultation with Stakeholders*

Experts in relevant fields, leaders of thought in environmental matters, Organs of the State, local communities have been consulted for their opinions on issues relating to the potential ecological and socio-economic impacts of the proposed project. This provided an

opportunity for stakeholders and the public at large to engage in the process and to make comments or express their concerns regarding the proposed development.

Table 4-2: Key findings of the public consultation process

SUMMARY OF ISSUES	
THEME	**ISSUE**
Economic	▪ Employment of general labour must consider employing local people from the local community. ▪ The company must take the social responsibility in and around the project area. ▪ Improve the life being of the local residents.
Health and Safety	▪ Waste management concerns including both solid waste and wastewater. ▪ Potential air, noise and water pollution due to development. ▪ The company must provide enough health care to employees
Ecological	▪ Concerns regarding impacts on and conservation of natural vegetation. ▪ Limited cutting down of trees should be observed by the construction company ▪ Resources such as air and water should not be polluted during operations because communities, wild animals and livestock rely on these resources.
Communication	▪ Clear communication needs to be promoted between relevant authorities and the local community.

5 CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1 OVERVIEW

The proponent recognizes the importance of undertaking the project operation in line with sustainable development objectives and applicable legal requirements. To this end an Environmental Management Plan (EMP) for the project is being developed in order to address negative environmental impacts and enhance positive impacts. The EMP takes into account identification of potential impacts, assessment of the significance of the risks associated with these impacts and the establishment of preventive actions as well as mitigation measures. The EMP will be monitored, reviewed, and updated as necessary with the aim of continuous improvement, taking into account various changes in project operations, the biophysical environment and socio-economic circumstances.

5.2 ASSESSMENT OF IMPACTS

This section outlines how the overall methodology to assessing the project's possible environmental and social impacts. Each potential impact must be assessed in order to properly evaluate its significance. The definitions and explanations for each criterion are set out below in Table 5-1.

Table 5-1: Assessment Criteria

Duration – What is the length of the negative impact?	
None	No Effect
Short	Less than one year
Moderate	One to ten years
Permanent	Irreversible
Magnitude – What is the effect on the resource within the study area?	
None	No Effect
Small	Affecting less than 1% of the resource
Moderate	Affecting 1-10% of the resource
Great	Affecting greater than 10% of the resource
Spatial Extent – what is the scale of the impact in terms of area, considering cumulative impacts and international importance?	
Local	In the immediate area of the impact
Regional / National	Having large scale impacts
International	Having international importance
Type – What is the impact	

Direct	Caused by the project and occur simultaneously with project activities
Indirect	Associated with the project and may occur at a later time or wider area
Cumulative	Combined effects of the project with other existing / planned activities
Probability	
Low	<25%
Medium	25-75%
High	>75%

(***Adopted from ECC-Namibia, 2017)***

Table 5-2: Impact Significance

Class	Significance	Descriptions
1	Major Impact	Impacts are expected to be permanent and non-reversible on a national scale and/or have international significance or result in a legislative non- compliance.
2	Moderate Impact	Impacts are long term, but reversible and/or have regional significance.
3	Minor	Impacts are considered short term, reversible and/or localized in extent.
4	Insignificant	No impact is expected.
5	Unknown	There are insufficient data on which to assess significance.
6	Positive	Impacts are beneficial

(Adopted from ECC-Namibia, 2017)

Table 5-3: Environmental Impacts and Aspects Assessment

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure
TOPOGRAPHY	Landscape Scenery	Visual aesthetic impact	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Minor	PV Plant & Transmission line
SOIL	Soil	Contamination to soil from waste disposal	Construction and Operations	Moderate	Small	Local	Direct	Low <25%	Minor	PV Plant
	Soil	Spillages of fuel, oil and lubricants.	Construction	Short	Small	Local	Direct	Low <25%	Minor	PV Plant & Transmission line
	Soil	Erosion	Operations	Moderate	Small	Local	Direct	Low <25%	Minor	PV Plant & Transmission line
LAND CAPABILITY	Terrestrial ecology and aquatic ecosystems	Change in land use	Construction and Operations	Permanent	Great	Local	Direct	Low <25%	Moderate	PV Plant
	Carrying capacity	Increase in human activities in the environment	Construction and Operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate	PV Plant & Transmission line
WATER	Surface water quality	Water pollution from oils and lubricants from	Construction and Operations	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Moderate	PV Plant and Transmission line

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure
		vehicles and machinery.								
	Surface water quality	Turbidity and high sediment load	Construction	Moderate	Small	Local	Direct	Low <25%	Moderate	PV Plant
	Soil, Vegetation, Infrastructure	Flooding	Construction& Operation	Permanent	Moderate	Local	Direct	Medium 25 - 75%	Moderate	PV Plant
AIR QUALITY	Air Quality	Construction phase dust	Construction	Short	Small	Local	Direct	Low <25%	Minor	PV Plant
WASTE	Groundwater quality	Hazardous waste such as waste oil and lubricants.	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	PV Plant
	Surface water quality	Threatened from plant stormwater discharge into the river.	Construction and operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate	PV Plant
	Topography and Landscape	Visual impacts due to use of unsustainable disposal methods	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	PV Plant and transmission line
FAUNA	Terrestrial ecology and biodiversity	Loss of habitat and driving away of local animals and	Construction and Operations	Moderate	Moderate	Local	Direct	High >75%	Minor	PV Plant& Transmission line

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure
		aquatic animal species								
	Avifauna	Bird electrocution, and physical crashes	Operations	Moderate	Small	Local	Direct	Low <25%	Minor	Transmission line
	Aquatic life	Antifouling paints	Operations	Moderate	Small	local	Direct	Low <25%	Minor	PV Plant
	Terrestrial ecology and biodiversity	Destruction of vertebrate fauna (e.g. road kills; fence and powerline mortalities)	Construction and Operations	Long	Moderate	Local	Direct	Low <25%	Minor	PV Plant & Transmission line
FLORA	Terrestrial ecology and biodiversity	Proliferation of invasive species inland	Construction and Operations	Long	Moderate	Local	Direct	High >75%	Moderate	PV Plant & Transmission line
	Terrestrial ecology and biodiversity	Illegal collection of firewood	Construction and Operations	Long	Moderate	Local	Direct	Low <25%	Minor	PV Plant & Transmission line
	Terrestrial ecology and biodiversity	Loss of unique flora and special habitats in the local environment	Construction and operations	None	Small	Local	Direct	Low <25%	Moderate	PV Plant & Transmission line

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure
		because of general nuisance and animal migrate.								
	Terrestrial ecology and biodiversity	Uncontrolled fires	Construction	Long	Great	Regional / National	Direct	Low <25%	Major	PV Plant & Transmission line
SOCIAL	Noise Pollution	Increased noise levels	Construction and operations	Moderate	Small	Local	Direct	Low <25%	Minor	PV Plant & Transmission line
	Socio Economic Activities	Temporary and permanent employment prospects.	Construction and operations	Long	Moderate	Regional	Direct	Medium 25 – 75%	Positive	PV Plant & Transmission line
	Socio Economic Activities	Climate change impacts	Operations	Long	Moderate	Regional / National	Direct	High >75%	Positive	PV Plant & Transmission line
	Contribution to National Economy	Employment, local procurement, duties and taxes.	Construction and Operations	Short	None	Regional / National	Direct	Low <25%	Positive	PV Plant & Transmission line

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure
Heritage/Archaeology	Graves, artefacts, archaeological high value components	Destruction or affecting heritage, paleontological and archaeological artefacts	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate	PV Plant & Transmission line
HEALTH AND SAFETY	Health Sanitation	Poor ablution and waste management facilities may be detrimental to human health.	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate	PV Plant & Transmission line
	Property and human life	Electrocution, fires resulting in fatalities, damage to properties, veldt fires and power surges.	Construction and Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	PV Plant & Transmission line