EnviroSolutions
Safety & Environmental Consultants

Environmental Impact Assessment Report

Prepared for the consortium:

- ERONGO DIAGRAM INVESTMENTS (PTY) Ltd
- CAPITAL RESOURCES SERVICES (PTY) Ltd

For the

Establishment of a 5 MW Solar Photovoltaic Park on a portion of Farm Groot Quinta 976, Omaheke Region

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Title: Establishment of a 5 MW Solar Photovoltaic Power Park

Project Location: Farm Groot Quinta 976, Omaheke Region.

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Table of Contents

1. List of Acronyms

DEA	Directorate of Environmental Affairs
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
I&AP	Interested and Affected Parties
MET	Ministry of Environment and Tourism
MW	Megawatt
PV	Photovoltaic
ToR	Terms of Reference

2. Executive Summary

2.1 Project Background

Erongo Diagram Investments Pty Ltd in association with Messrs Capital Resources Services (PTY) Ltd, intend to establish a solar photovoltaic plant on a portion of Farm Groot Quinta 976, approximately 43km east of Gobabis in Omaheke region. The objective of the project is to harvest solar radiation that will generate electricity and be fed into Namibia's national power grid via NamPower substation Omaere – Ghanzi. This will be in line with the Namibian Government's request to make use of renewable energy sources in addition to the current electricity generation methods. The proposed solar plant will be a 5 MW power plant.

In terms of the Environmental Management Act (7 of 2007) and the 2012 Environmental Impact Assessment (EIA) Regulations, this proposal triggers the Environmental Impact Assessment process.

Erongo Diagram Investments Pty Ltd, the Proponent appointed EnviroSolutions to complete the EIA for this project. The completion of an EIA before this development is consistent with the Namibian environmental regulatory requirements. The objectives of the EIA are therefore as follows:

- To obtain approval from the Ministry of Environment and Tourism for the envisaged development.
- To assist the relevant authorities with a decision on the allocation of a preferred site for the intended development.
- To identify all potential risks and environmental impacts associated with the intended development.
- To investigate any socio-economic impacts associated with this project, both positive and negative.
- To suggest the most suitable mitigation measures so as to reduce the nature and extent of any negative impact on the environment associated with this project.
- To investigate the current and pending legal framework to which this project will need to comply, and finally,
- To identify and consult with all relevant Interested stakeholders so as to incorporate their concerns and suggestions into the planning phase of this project.

2.2 Terms of Reference

The Terms of Reference (ToR) provided by the client is described in this section. This is also aligned with the requirements of the Environmental Management Act 7 of 2007 and the 2012 Regulations. The following was therefore required as part of the scope of work:

Environmental Impact Assessment: It is expected that the EIA should be able to explain how to deal with the identified impacts to eliminate or minimize it during the construction and operational phases.

Impacts that might be considered include the following:

- **Air Quality**
- **Surface Water**
- **Fauna and Flora**
- **Land use plans**

Impacts should also be classified for Normal, Abnormal and Emergency situations using the criteria below:

The type

- ***Permanent or***
- ***Temporary***

The magnitude

- ***Low***
- ***Medium***
- ***High***

2.3 Alternatives (Including the No-Go Option)

The current site at Farm Groot Quinta 976 serves as an amendment relating to the location of the envisaged project. It is imperative that the infrastructure need to be in close proximity to an existing substation such as the Omaere – Ghanzi, to minimise impacts related to power line connectivity.

The No-Go alternative is the option of not proceeding with the activity, which implies a continuation of the status quo. Should this particular development not go ahead, none of the potential impacts (positive and negative) identified would occur.

2.4 Assumptions and Limitations

- All information received from sources contributing to this project is correct.
- That the applicant will implement the recommendations derived from this study.

2.5 Summary of Key Findings

Key findings of the Environmental Impact Assessment Study indicate that the project can be implemented, provided the recommended control measures are implemented.

- The site that has been selected for the solar power plant needs be near an existing substation in order to ensure that power that is generated can be supplied to the NamPower grid with minimum additional infrastructure.

- The area that is earmarked for the solar power plant is densely vegetated but does not constitute potential sensitive biodiversity areas.

- There are some negative impacts during the construction phase. These impacts will be localized and do not necessarily have a negative impact on the biodiversity of the surrounding environment.

- The envisaged development will improve power supply to Omaheke Region, and Namibia and will also ensure that long term Solar Power Generation infrastructure is put in place.

- The socio economic impacts associated with the solar power plant construction will have an insignificant effect on the towns of Gobabis or Witvlei since it is not expected that jobseekers will inhabit these towns.

It is also imperative that the Proponent ensures the mitigation measures are incorporated and adhered to. It is therefore recommended that these mitigation measures form part of a legal agreement between the relevant parties.

3. Introduction

3.1 The background and Context of this report

Erongo Diagram Investments Pty Ltd in association with Messrs Capital Resources Services (PTY) Ltd, intend to establish a solar photovoltaic plant on a portion of Farm Groot Quinta 976, approximately 43km east of Gobabis in Omaheke region. The objective of the project is to harvest solar radiation that will generate electricity and be fed into Namibia's national power grid via NamPower substation Omaere – Ghanzi. This will be in line with the Namibian Government's request to make use of renewable energy sources in addition to the current electricity generation methods. The proposed solar plant will be a 5 MW power plant.

The envisaged development will consist of one (1) plant on a portion of Farm Groot Quinta 976, covering a land size of 15 hectares of the 19 hectares owned by the developer.

For a development of this nature an EIA is required. The Risk Assessment and EIA needs to be reviewed by the relevant authorities before a final decision is taken on whether the project can proceed.

- The completion of an EIA before the project commences is consistent with the Namibia's Environmental Assessment Policy (1995) and the Environmental Management Act (GN27, 2007: GG3966). It is intended to identify potential environmental and social impacts associated with a project of this nature. This is essential to ensure that mitigation measures, if required, are included into the initial stages of the project and the identification of possible impacts and issues associated with the proposed development.

EnviroSolutions was appointed to facilitate the completion of the Environmental Impact Assessment Report for this development. The objective is to identify the potential impacts associated with a development of this nature and to provide mitigation measures to ensure that potential impacts to the environment are managed effectively.

This report comprises an assessment of the likely impacts, and aspects relating to the proposed construction and operation of the solar power plant. These were identified through site visits, investigations, and review of existing information available for the area.

3.2 Approach Methodology

The intention of the study is to ensure the envisaged activities by Erongo Diagram Investments are aligned with the Namibian legal requirements. Furthermore, proper mitigation measures should be implemented to ensure the success of the project. The following approach was used during the completion of the EIA:

1. Site visit and evaluation site sensitivity.
2. Investigation and assessment of potential effects associated with the envisaged power line.
3. Consultation with the relevant Authorities.
4. Completion of a risk assessment, to predict the conditions likely to result from activities associated with this development.
5. Development of a management plan to mitigate potential negative impacts.

EnviroSolutions takes cognizance of the fact that the Environmental Assessment report will be independently reviewed by the Ministry of Environment and Tourism (MET). In this way, practical and realistic solutions to potential problems can be identified in a consultative manner where all stakeholders are involved. The intention of this report is to ensure the project achieves regulatory compliance, appropriate environmental evaluation is in place and proper mitigation measures are implemented.

4. Project Description

4.1 The need for this project

At present Namibia imports about 60% of her electricity from neighbouring countries including South Africa who is finding it increasingly difficult to keep up with its own energy needs. The aim of the project is to generate electricity, making use of renewable energy sources. The solar plant is aligned with the Namibian Government's vision to make use of renewable energy sources in addition to the current electricity generation methods. Erongo Diagram Investments intends to supplement the current electricity supply and will contribute towards ensuring long term sustainable power supply.

4.2 Project Location

The Solar PV Power Park shall be erected on 15 hectares of the developer's 19 hectares privately owned land on a portion of Farm Groot Quinta 976 adjacent the (B6) Kalahari Highway, approximately 43km east of Gobabis in the Omaheke Region. Existing infrastructure in the vicinity are a wire farm fence, the Telecom Tower and the Omaere – Ghanzi Substation that will receive the electricity from the solar power inverters, feeding it into the national power grid. The project area is relatively flat and is densely vegetated by shrubs and scattered trees. The project site location is best appreciated in the figures that follow.

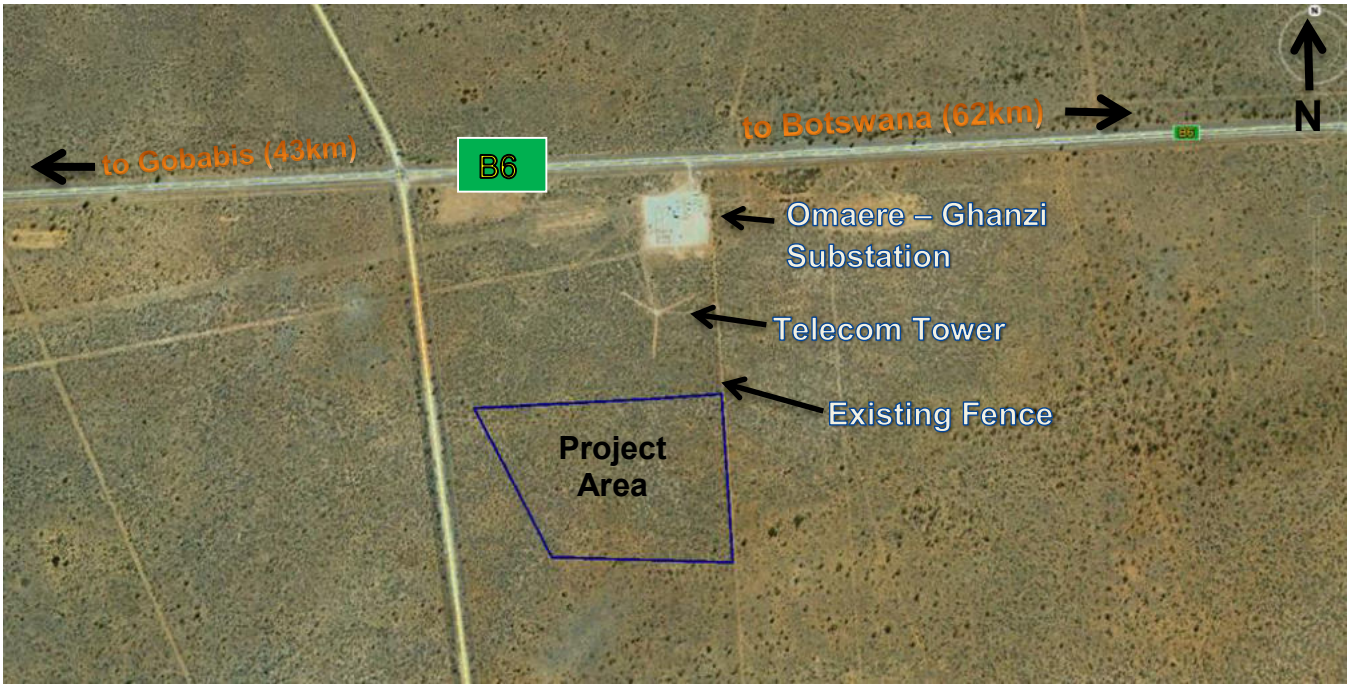


Figure 1: Project Area, Farm Groot Quinta 976, Omaheke Region

Figure 2: An architects proposal, using 15 hectares for the PV plant within the project area

4.3 The Proposed Development

4.3.1 Photovoltaic Plant Layout

The project layout is planned with fixed mounting rack systems. The modules are mounted horizontally in landscape format. The racks are orientated North (0° from North) and the tilt angle is 15°. The inclined height of the rack is approximately 4.0 m.

It is anticipated that Photovoltaic (PV) panel arrays with approximately 16480 panels and 70 inverters will be installed (refer to annexure B for full layout summary). Additionally, an area of approximately 15 hectares is to be utilized for the PV plant. The panels are typically mounted into metal frames which are usually aluminium. Concrete or screw pile foundations are used to support the panel arrays.

The arrays are tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture maximum sunlight.

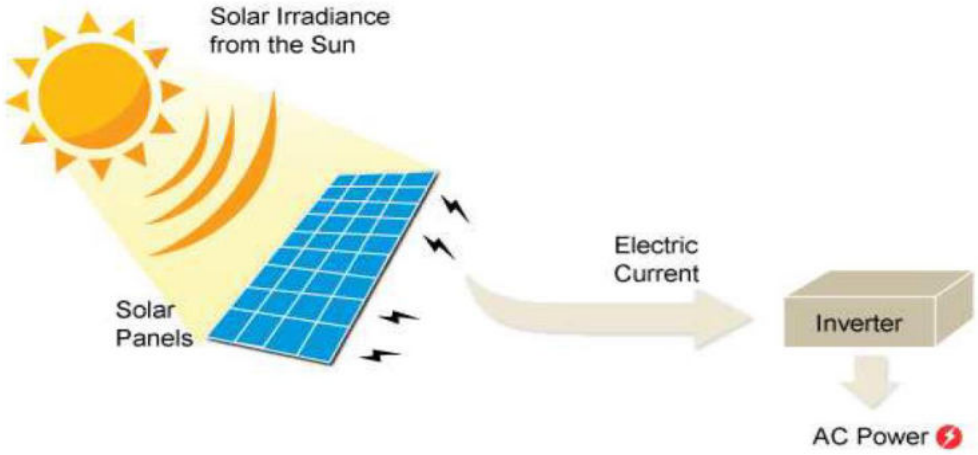


Figure 3: Illustration of PV panel operation

4.3.2 Electrical Infrastructure

The PV arrays are typically connected to each other in strings and strings are connected to AC inverters. 20 modules/solar panels will be connected serially to one string; each inverter holds four strings. The DC to AC inverters will be mounted on the back of the panels support substructures / frames or alternatively in a central inverter station which will in turn be linked to the transformers that will be feeding the NamPower grid.

The proposed solar power plant will be located near an existing substation to prevent additional construction of overhead power lines, using either pole or pylon construction methods

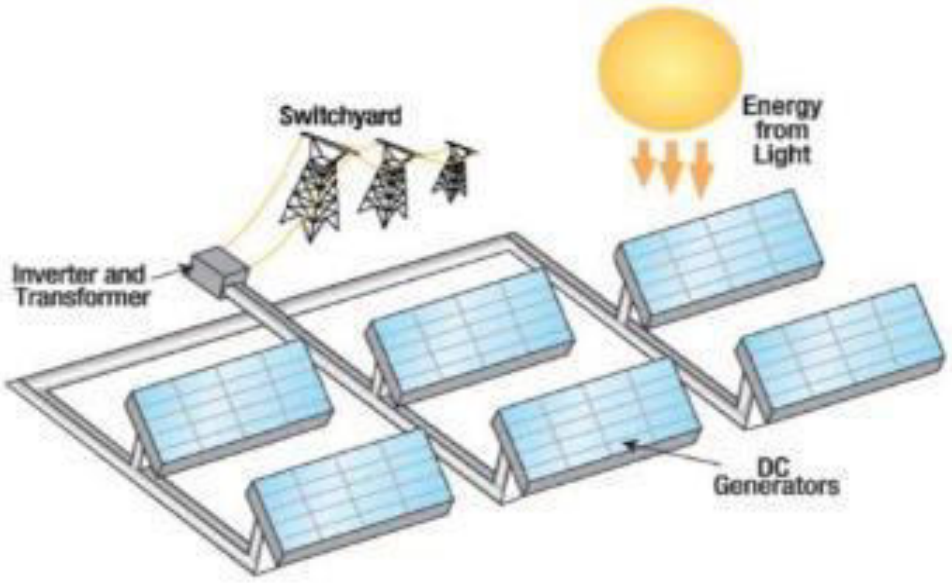


Figure 4: PV process

4.3.3 Access to the project areas

No new roads need to be constructed as the proponent intend on using the B6 national road for the transport of building material as well as construction workers. Additionally, there is an existing dirt road from the B6 used by NamPower and Telecom to access their infrastructure for maintenance. Space will kept alongside the existing fence on the eastern side of the project area for farmers to access their livestock and land.

4.3.4 Waste water and Effluent Treatment

It is highly unlikely that large quantities of water will be used during the construction and operational phases of the project. In the case where waste water is produced, the water will be collected and kept for disposal at the appropriate facilities within the municipal area of Gobabis. Portable toilets should be provided to the construction workers at the project area. Under no circumstance is waste water or effluent to come into contact with the land.

4.3.5 Solid Waste Management

All solid waste produced during the constructing phase should be disposed of appropriately. Littering is not permitted and is also punishable by Law. All mechanical waste is to be collected and disposed of at an approved landfill site such as in Gobabis.

4.4 Typical Construction Activities

The area is densely vegetated by what is categorised in the *Atlas of Namibia* as the North-eastern Kalahari Shrub land–Woodland. A great deal of de-bushing work but limited ground work will be required as the ground is fairly levelled and ideal for the solar power plant. The proposed site is best appreciated in the picture below.

Figure 5: View of the project area

Construction Activities will be as follows:

- De-bushing and some levelling of the project site
- Installation of the DC generators
- Installation of electrical cables
- Connection of Photovoltaic power plant to Omaere - Ghanzi Substation
- Vehicle traffic on the site
- Construction of small site office

5. Regulatory Framework and other Requirements

5.1 Regulatory Agencies

The regulatory agencies guarding or implementing the relevant environmental regulations are listed as follows:

Table 1: **Government agencies regulating environmental protection in Namibia.**

REGULATING AGENCY	ROLE IN REGULATING ENVIRONMENTAL PROTECTION
Ministry of Environment and Tourism (MET)	MET is the lead government agency charged with Environmental Monitoring, Assessment and Management. The mission of MET is to maintain and rehabilitate essential ecological processes and life-supported life-support systems, to conserve biological diversity and to ensure that the utilization of natural resources is sustainable for the benefit of all Namibians, both present and future, as well as the international community, as provided for in the Constitution. MET lays a foundations to implementation and promulgation of regulations relevant to this project including; the Environmental Act no7. Of 2007, Park and Wildlife Management Bill, the Pollution Control and Waste Management Act , The MET plays role in approval of Environmental Impact Assessments (EIAs) which are prepared under Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1995). Provisions in other line ministries' legislation (strengthens MET's position.

5.2 Environmental Management Requirements

An important component of an Environmental Assessment process is the review of applicable and relevant legislation pertaining to this project. The legislative and regulatory foundation for protection and management of the environment and its natural resources is governed by the Namibian Constitution. Article 95(l) of the constitution clearly emphasizes the promotion of the welfare of the people, whereby *the maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular*.

In terms of the Environmental Management Act (7 of 2007) and the 2012 Environmental Impact Assessment (EIA) Regulations, this activity triggers the Environmental Impact Assessment process. The intended activity is a listed activity under Annexure 1(b) of the EIA Regulations and it that states that the "the transmission and supply of electricity" may not be undertaken without an Environmental Clearance Certificate.

The completion of an EIA before this development is consistent with the Namibian environmental regulatory requirements.

These instruments make it mandatory for any proposed development to be subjected to an Environmental Assessment procedure. Both promote sustainable development and economic growth while safeguarding the environment in the long run. The figure on the next page illustrates the Environmental Assessment process in Namibia.

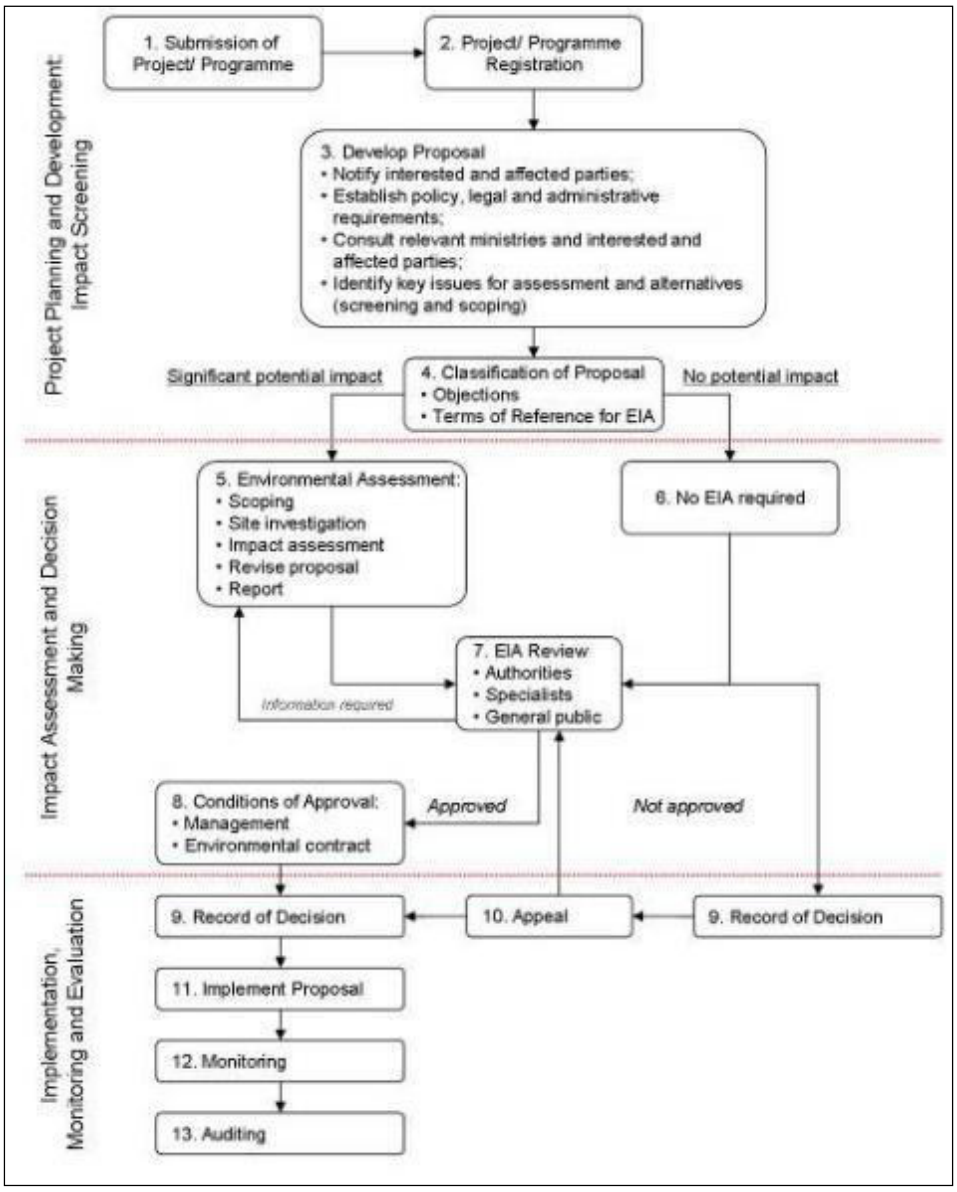


Figure 6: Illustration of the EIA Process in Namibia

Currently the project is at Stage 5: Environmental Assessment. Once the Environmental Assessment Process has been completed the final document will be reviewed by the authorities, specialists and the public. Before the project can be implemented, a record of decision will be taken.

5.3 Legislation of international significance

5.3.1 Convention on Wetlands and Biological Diversity

The Convention on Wetlands of International Importance, especially as Waterfowl Habitat, 1971 (Ramsar) aims primarily to prevent the loss of wetlands, to promote the wise use of these, and to give special protection to listed wetlands. The Convention stresses a habitat-type approach rather than a species-specific approach.

The primary goal of the Convention on Biological Diversity, 1992, is the conservation of biodiversity. The causes of threats to biodiversity should be anticipated and prevented, and the precautionary principle should be applied. Parties to the convention are obliged to:

- Establish a network of protected areas;
- Create buffer areas adjacent to these protected areas using environmentally sound and sustainable development practices; and
- Rehabilitate degraded habitats and populations of species.

5.3.2 Convention on Combat Desertification (CBD)

The convention recognized that the conservation of biological diversity is “a common concern of humankind” and is an integral part of the development process. The agreement covers all ecosystems, species, and genetic resources. It links traditional conservation efforts to the economic goal of using biological resources sustainably. It sets principles for the fair and equitable sharing of the benefits arising from the use of genetic resources, notably those destined for commercial use.

The objectives of the CBD are:

- The conservation of biological diversity,
- The sustainable use of its components and
- The fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding**.**

The Proponent and the contractors should therefore prevent the unnecessary disturbance of any species during the construction and operational phases. Conservation of species and ecosystem to combat the increasing rate of loss of biological diversity is one of Namibia’s challenges due to a heavy reliance on natural resources and ecosystem goods and services.

In the interest of welfare of the people, the state has adopted policies aimed at maintaining ecosystems, ecological processes and biodiversity for the benefit of present and future generations. The National Biodiversity Strategy and Action Plan (NBSAP) and the Namibia Community-based Tourism Association (NACOBTA) can assist the Proponent in environmental management issues. Direct impact on biodiversity is minimal but a precautionary approach is necessary to ensure those disturbances are avoided.

5.4 Legal Requirements of national significance

National legislation exists to protect the environment and threats to public health. Included, among others, are issues related to the protection of public water supplies, nuisances and other public health issues. Nuisances are broadly defined as any condition which is considered to be offensive, injurious or dangerous to health. This definition is broad enough to cover a range of issues, and thus this law may be effective in any instance where public health might be compromised.

5.4.1 Legislation related to Electricity Generation

The 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). 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.

Of relevance is that fact that the Proponent and its contractors should ensure that compliance with the relevant Health, Safety and Environmental Management legislation is maintained.

5.4.2 Legislation related to Public Health

Section 119 of this Act prohibits the existence of a nuisance on any land owned or occupied by the Proponent. The term nuisance is important for the purpose of this EIA, as it is specified, where relevant in Section 122 as follows:

a) any dwelling or premises which is or are of such construction as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease;
b) any dung pit, slop tank, ash pit or manure heap so foul or in such a state or so constructed as to be offensive or to be injurious or dangerous to health;

c) any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health; or
d) any other condition whatever which is offensive, injurious or dangerous to health.

5.4.3 Legislation related to Construction and Demolition

The following is relevant in terms of the Health and Safety Regulations under the Labour Act:

Noise
No employer shall require or permit an employee to work in an environment in which he or she is exposed to an equivalent noise level equal to or exceed 85 dB (A).
If the equivalent noise level to which employees are exposed in any work-place is equal to, or exceeds, 85 dB (A), the employer shall reduce the levels to below 85 dB (A) or, if this is not practicable, he or she shall reduce the level to as low as is practicable and take all reasonable steps to the satisfaction of an inspector, isolate the source of the noise. Of relevance is the fact that holes will be drilled with noisy equipment for the planting of wooden poles.

5.4.4 Legislation related to Air Quality

Air pollution is controlled primarily by the Atmospheric Pollution Prevention Ordinance (11 of 1976). This Ordinance generally provides for the prevention of the pollution of the atmosphere.

Part IV of this ordinance deals with dust control. The Ordinance is clear in requiring that any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance.

Of applicability to the envisaged project, is dust generated by vehicles or equipment as well as dust generated during excavation of foundation and earth works. The risk of dust generation is however low.

5.4.5 Legislation related to Soil Conservation

The objectives of the Soil conservation Act 76, 1969 are to make provision for the combating and prevention of soil erosion, and for the conservation, protection and improvement of the soil, the vegetation and the sources and resources of the water supplies.

Part II, deals with soil conservation works and it further states that in section 4(1) The Minister may by means of a direction order the owner of land to construct the soil conservation works referred to in such direction either on land belonging to such owner or on land belonging to another person, in such manner and within such period as may be mentioned in such direction, if the Minister is of the opinion that the construction of such soil conservation works is necessary in order to achieve any object of this Act in respect of the land belonging to such owner.

Of relevance is the fact that adjacent areas to the project site should not be disturbed. The use of existing tracks is essential. The Proponent should however ensure that when areas outside the project site boundaries are disturbed, rehabilitation should be conducted immediately once the activity has been completed.

5.4.6 Legislation related to petroleum products

Regulations made under the Petroleum Products and Energy Act 13 of 1990 states that:

A license or certificate is required for purposes of storing or keeping fuel in a quantity of 200 litres or less in any container kept at a place within a local Authority area or fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area.

Containers used to store or convey petroleum products

Petroleum product containers must be completely leak-proof and spill-proof and otherwise safe and suitable for storage and conveyance. Such containers may not be used as water trough or for any purpose that may cause environmental harm, safety or health of any person or animal.

Of relevance is that fact that heavy equipment or vehicles may carry significant quantities of fuel and proper precaution should be taken to prevent spills.

6. Description of the Local Environment

This section describes components of the existing environment that could be affected by the Proposed Action. The environmental components described include land use, biological conditions, air, and water.

6.1 Current Land Use

The project site area is located on private farmland that is currently vacant and densely vegetated. The area to be utilized measures 15 hectares in total. The Project area is surrounded by the following

- Wire farm fencing to the east
- Telecom tower, Omaere – Ghanzi substation and B2 Highway to the north
- D1603 dirt road to the west, that gives access to:
- Ernst Meyer Primary Farm School 3km to the south

6.2 Biological Conditions

6.2.1 Drainage

There is no drainage channels present at the project area.

6.2.2 Flora

Figure 7: Panoramic view of the project site flora

For the larger part of the project site, vegetation is dense but species diversity is very low. The following images are photos of the most abundant plant species taken at the site:

Terminalia sericea

Deciduous tree, or sometimes a shrub, up to 8m high, with branches often horizontal and conspicuously layered; restricted to sandy soils and occurring in various savannah types and in dry woodland. The leaves are browsed by game and livestock. Traditionally the bark is used to treat dysentery and diabetes. The wood is hard, strong and attractive and generally used for firewood and as building material. The *T. sericea* is a predominant tree species on the project site and is not classified as endangered nor protected by forestry legislation.

Grewia sp.

Deciduous to semi-deciduous shrub. Found on various substrates (sandy and rocky) and in a variety of habitats young shoots and fruit are eaten by animals during shortages of green grass. The flesh of the fruit is sweet. Porridge is made from dry flour obtained by pounding dry fruits. The fruit is also popular for brewing alcoholic beverages. There are no conservation concerns for these species.

Acacia luederitzii

Deciduous shrub or tree up to 5m high with spreading crown. It grows predominantly on Kalahari sands. This tree is browsed especially the young shoots. The wood and bark are used for construction. Root bark and the root core are used for traditional purposes. There are no conservation concerns for this species.

Table 2 below shows the abundance of tree species found in the quarter degree square 2219AD of the *Tree Atlas of Namibia*. The Project Site is located within 2219AD.

Table 2: **Abundance and Conservation Concern for tree species found near Farm Groot Quinta**

Species	Common Name	Abundance	Conservation Concerns
Acacia erioloba	Camelthorn	Common to abundant	Protected by forestry legislation
Acacia fleckii	Sand-veld Acacia	Uncommon to rare	None Recorded
Acacia hebeclada subsp. hebeclada	Candle-pod Acacia	Common to abundant	None Recorded
Acacia hereroensis	Bergdorn	Uncommon to rare	None Recorded
Acacia karroo	Soetdoring	Uncommon to rare	None Recorded
Acacia luederitzii	Kalahari Acacia	Uncommon to rare	None Recorded
Acacia mellifera subsp. detinens	Swarthaak	Occasional	Aggressive, Invasive Species
Acacia nebrownii	Slapdoring	Occasional	None Recorded
Albizia anthelmintica	Mupopo	Uncommon to rare	Protected by forestry legislation
Bauhinia petersiana	Koffiebeesklou	Occasional	None Recorded
Boscia albitrunca	Omunghudi	Occasional	Protected by forestry legislation
Burkea africana	Omutundungu	Uncommon to rare	Protected by forestry legislation
Catophractes alexandri	Ghabbabos	Occasional	None Recorded
Dichrostachys cinerea	Omutjete	Occasional	Aggressive, Invasive Species
Diospyros lycioides	Omuzeme	Occasional	None Recorded
Ehretia alba	Deurmekaarbos	Occasional	None Recorded
Ehretia namibiensis	Namibian Puzzle-bush	Uncommon to rare	None Recorded
Elephantorrhiza elephantina	Omundjoze	Common to abundant	None Recorded
Grewia flava	Velvet Raisin	Common to abundant	None Recorded
Grewia flavescens	Sandpaper Raisin	Occasional	None Recorded
Grewia retinervis	Mupundu	Occasional	None Recorded
Gymnosporia senegalensis	Bloupendoring	Uncommon to rare	None Recorded
Lycium bosciifolium	Wolfdoring	Uncommon to rare	None Recorded
Ozoroa paniculosa	Common Resin-bush	Common to abundant	None Recorded
Phaeoptilum spinosum	Brosdoring	Occasional	None Recorded
Rhigozum brevispinosum	Osapati	Common to abundant	None Recorded
Rhus lancea	Karee	No estimate	Protected by forestry legislation
Rhus tenuinervis	Kalahari Currant	Occasional	None Recorded
Tarchonanthus camphoratus	Camphor Bush	Common to abundant	None Recorded
Terminalia sericea	Silver Cluster-leaf	Common to abundant	None Recorded
Ziziphus mucronata	Buffalo-thorn	Common to abundant	None Recorded

6.2.3 Fauna

The project area is located close to the B6 Highway that runs along the central to eastern part of Namibia. The density of people in the region, existing infrastructure such as the substation, farm school, farming activities and road maintenance workers has resulted that there has been a migration of species from the area. Currently there is a low diversity and endemism of birds, amphibians, plants and large mammals (figures 8 and 9 below). The specific area earmarked for the development, however only represents a fraction of the overall ecosystems/ landscapes in the surrounding environment. The envisaged impact at the project site, is thus not of such magnitude and/ or significance that it will have irreversible impacts on the biodiversity and endemism of the area and Namibia at large.

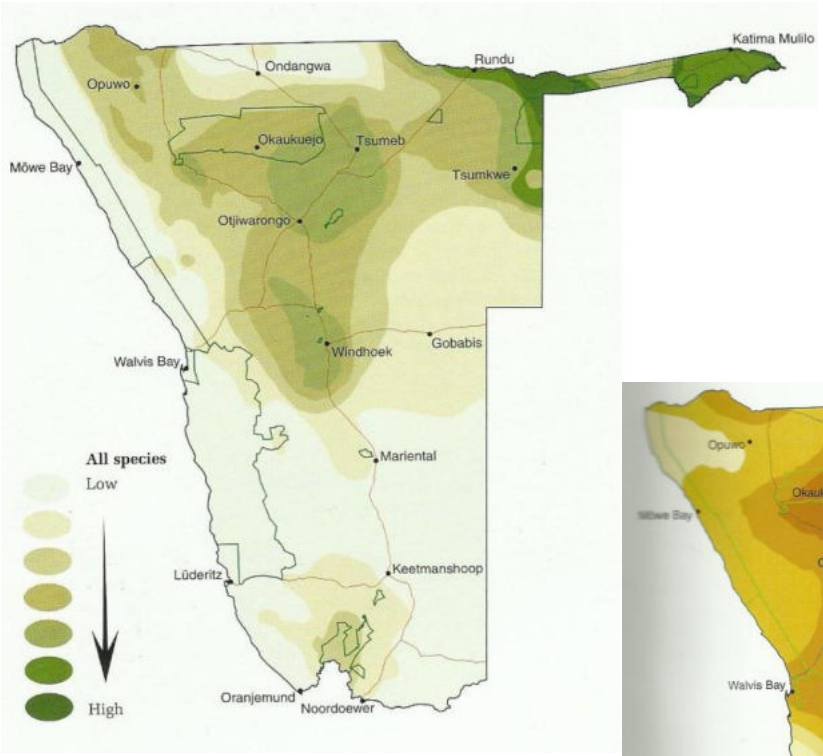


Figure 8: The overall terrestrial diversity in Namibia

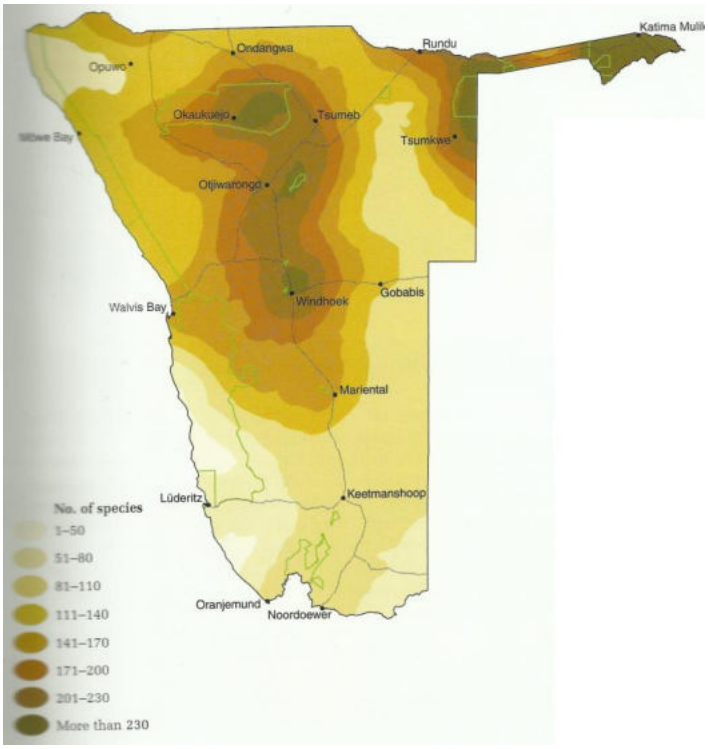


Figure 9: The diversity of birds in Namibia

6.3 Water

Rainfall distribution throughout Namibia is extremely variable with evaporation in excess of precipitation. Water availability in general is also variable from one year to the next, making arid and semi-arid regions, such as Namibia, very vulnerable to a succession of dry years. These variations can be attributed to changing weather conditions and, to some extent, (increasing) water-use demands.

The study zone is described by semi-arid with an average annual rainfall of 375mm.

6.4 Air quality: Existing sources of atmospheric emissions

The major current atmospheric dust emissions in the area are primarily generated by the vehicles travelling on gravel roads.

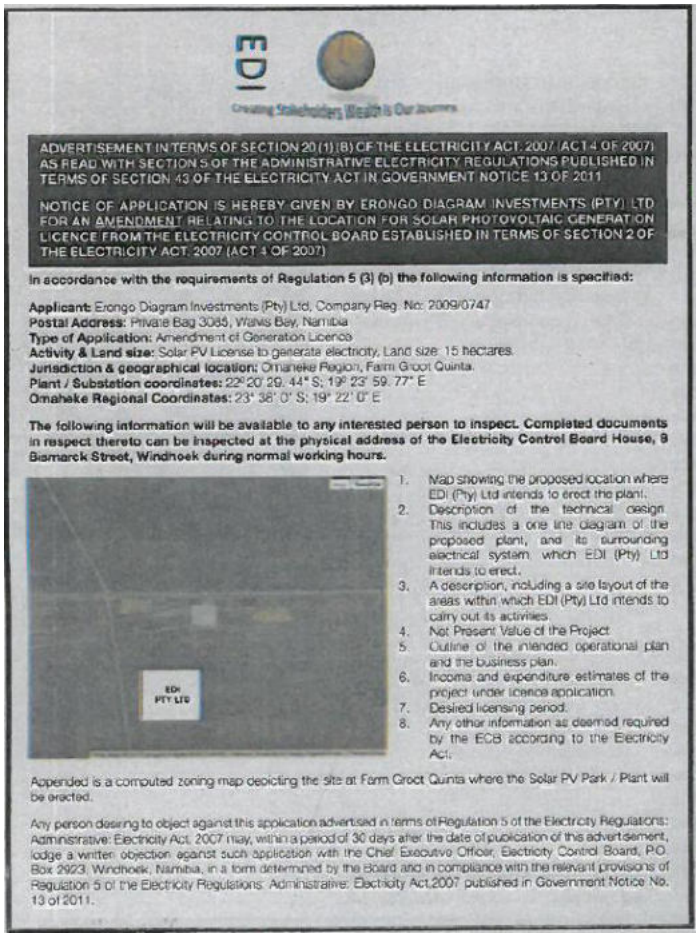
Weather data was not readily available for the area. As Namibia is known as a sink and not a source of CO_2 and other ozone depleting substances, the assumption used here is that the emissions are insignificant

7. Stakeholder Consultation

The purpose of stakeholder consultation process is to increase awareness by involving people who are directly affected or concerned about this development. This is a vital factor during the planning and success of the development. Allowing stakeholder approval gives assurance and a sense of partnership with the developer and prevents unnecessary disputes and costs during the establishment of the project.

The Proponent has consulted with NamPower, Telecom, the adjacent farm owners and the Electricity Control Board regarding the envisaged development. These parties seconded the project seeing that it is a positive development and it will contribute significantly towards alleviating the power shortages in the country. A Generation Licence with number G-126-010713-25 grants Erongo Diagram Investments with the permission to supply electricity to a supplier for further distribution to consumers in the Omaheke region, subject to the conditions as imposed by the honourable Minister and set out in this License and Electricity Act, 2007.

Advertisements about the intended development were placed in local media and no objections were received (figure 10 below)



EDI

ADVERTISEMENT IN TERMS OF SECTION 20 (1) (B) OF THE ELECTRICITY ACT, 2007 (ACT 4 OF 2007) AS READ WITH SECTION 5 OF THE ADMINISTRATIVE ELECTRICITY REGULATIONS PUBLISHED IN TERMS OF SECTION 43 OF THE ELECTRICITY ACT IN GOVERNMENT NOTICE 13 OF 2011

NOTICE OF APPLICATION IS HEREBY GIVEN BY ERONGO DIAGRAM INVESTMENTS (PTY) LTD FOR AN AMENDMENT RELATING TO THE LOCATION FOR SOLAR PHOTOVOLTAIC GENERATION LICENCE FROM THE ELECTRICITY CONTROL BOARD ESTABLISHED IN TERMS OF SECTION 2 OF THE ELECTRICITY ACT, 2007 (ACT 4 OF 2007)

In accordance with the requirements of Regulation 5 (3) (b) the following information is specified:

Applicant: Erongo Diagram Investments (Pty) Ltd, Company Reg. No: 2009/0747
Postal Address: Private Bag 3088, Walvis Bay, Namibia
Type of Application: Amendment of Generation Licence
Activity & Land size: Solar PV License to generate electricity, Land size: 15 hectares
Jurisdiction & geographical location: Omaheke Region, Farm Groot Quinta.
Plant / Substation coordinates: 22° 20' 29. 44" S; 19° 23' 59. 77" E
Omaheke Regional Coordinates: 23° 38' 0" S; 19° 22' 0" E

The following information will be available to any interested person to inspect. Completed documents in respect thereto can be inspected at the physical address of the Electricity Control Board House, 9 Bismarck Street, Windhoek during normal working hours.

1. Map showing the proposed location where EDI (Pty) Ltd intends to erect the plant.
2. Description of the technical design. This includes a one line diagram of the proposed plant, and its surrounding electrical system which EDI (Pty) Ltd intends to erect.
3. A description, including a site layout of the areas within which EDI (Pty) Ltd intends to carry out its activities.
4. Net Present Value of the Project.
5. Outline of the intended operational plan and the business plan.
6. Income and expenditure estimates of the project under licence application.
7. Desired licensing period.
8. Any other information as deemed required by the ECB according to the Electricity Act.

Appended is a computed zoning map depicting the site at Farm Groot Quinta where the Solar PV Park / Plant will be erected.

Any person desiring to object against this application advertised in terms of Regulation 5 of the Electricity Regulations: Administrative: Electricity Act, 2007 may, within a period of 30 days after the date of publication of this advertisement, lodge a written objection against such application with the Chief Executive Officer, Electricity Control Board, P.O. Box 2923, Windhoek, Namibia, in a form determined by the Board and in compliance with the relevant provisions of Regulation 5 of the Electricity Regulations: Administrative: Electricity Act,2007 published in Government Notice No. 13 of 2011.

Figure 10: Advertisement placed in ***Namibian*** newspaper for registration of I&AP dated Tuesday, 6 January 2015.

8. Potential Social and Environmental Impacts

In this chapter, potential environmental impacts associated with the envisaged project are examined. A summary of the potential impacts associated with the envisaged Solar Park construction and operational activities are presented, together with suggested mitigation measures required to ensure impacts are managed effectively.

An Environmental Management Plan (EMP) is a legally binding document and will form the basis of the environmental contract between the Proponent and the Ministry of Environment and Tourism (MET). In this way, the EIA report and EMP report will assist both parties in ensuring impacts to the environment are minimized during this project.

The below table summarizes the key issues and potential impacts as identified using the information presented above on the descriptions of the planned operation and the existing environment.

Within the accepted broad definition of the term “environment” that applies to Environmental Impact Assessments, it is required to assess potential socio-economic impacts as part of this study. The significance of the impact and the resulting management priority arising from the occurrence of an aspect is considered to be a function of the two factors described below:

1) **Likelihood of the impact:**
   An environmental aspect is considered to be the “trigger mechanism” that will result in the occurrence of the environmental impact or consequence. The potential significance of the impact is therefore a function of the likelihood that the impact will occur. (Note: The assessment of likelihood is specific to the occurrence of the aspect and not the activity). The likelihood of an impact is related to the level of control associated with the activity under normal and abnormal conditions and the potential for accidents to happen.

2) **Consequence of the impact:**
   Assuming that the impact has taken place, the consequences of the impact is assessed. The effect of pollution to the environment and the business are considered when determining the consequences.

8.1 Potential Socio-Economic Impacts

Within the accepted broad definition of the term “environment” that applies to Environmental Impact Assessments, it is required to assess potential socio-economic impacts as part of this study.

Potential socio-economic factors that are typically associated with an Environmental Impact Assessment are listed below, with a brief comment made in each case as to their relevance and significance to this particular project.

8.1.1 Changes in employment opportunities within the region

It is envisaged that the planned activity will create significant new employment opportunities during construction phase of three to four months.

The current estimations indicate that approximately 80 jobs will be created during construction and 10 permanent jobs will be created once the facility becomes operational. About 40 of the 80 jobs during construction will be regional sourced labour whereas the rest will be from existing contractor firms and suppliers.

8.1.2 Changes in the composition of the local community during construction

Since there will be limited new employment opportunities it is not anticipated that potential jobseekers would “invade” the area.

8.2 Environmental Impacts

8.2.1 Alterations to the natural topography

Impact Description

The study area is primarily vegetated with typical woodland vegetation that provides shelter for small invertebrates and other species.

During the construction phase certain areas of the project site will be levelled in order to set up the site infrastructure. This will result in trampling and removal of existing vegetation, soil excavation and potential oil pollution from heavy construction equipment. The natural topography will be permanently altered. The duration of these impacts will only be as long as the construction phase. Highlight the total area that will be altered.

Mitigation Measure
Only the access routes to the project site should be utilized and heavy mobile equipment and construction vehicles should be limited to within the boundaries of the project site. Stockpiling of materials on site and pollution by building material should be prevented and limited as far as possible.

Although most of the vegetation within the project site will be permanently lost, it is not endemic to this area. The vegetation found at the project area are classified as low risk in the Red Data Listing and have a least concerned conservation status. There are no mitigation measures for the loss of vegetation during the construction and landscaping phase. Natural occurring vegetation should be incorporated into the greenery where practically possible to maintain the biodiversity of the area.

8.2.2 Impacts on Fauna

Impact Description
The current vegetation provides shelter to a variety of small reptiles (lizards) that may occur on the site, which will be disturbed during the construction phase of the proposed development. The area is however not pristine since there are existing infrastructure surrounding the site. The less tolerant animal biodiversity has probably already moved away. Since the vegetation will be disturbed or removed during the construction phase these small invertebrates will either be destroyed or move to the nearest undisturbed areas surrounding the project sites. Birds that might have used this area for feeding or roosting purposes will move to other undisturbed areas. The limited bio-diversity of the area will be further altered

Fauna in this area, like the flora, is not unique to the project site and is found in the surrounding environment. The species that occur here are also classified as low risk in the Red Data Listing and have a least concerned conservation status.

Mitigation
There are no mitigation measures that would prevent fauna from moving away from this area.

8.2.3 Visual amenity impacts

Impact Description
The area where the development will be located is on the developer's privately owned land. Dense vegetation shields visibility of the project site from the B6 highway. Additionally the presence of the substation and Telecom tower visually makes for an already disturbed area. The structures and associated power lines may therefore not have a significant effect on environmental aesthetics.

Mitigation Measure
There are no mitigation measures for visual impacts.

8.2.4 Impacts related to domestic sewage effluent disposal

Impact Description
It is envisaged that employees will not reside within the project area. Domestic effluent or waste could be generated and could potentially pollute the area if not managed properly.

Mitigation Measure
Portable ablution facilities should be made available for workers during operational hours.

8.2.5 Impacts related to solid waste disposal

Impact Description
It is envisaged that solid waste will be generated. Solid waste will mainly be generated from the construction activities. Hazardous wastes e.g. hydraulic oils from heavy equipment may also be generated.

Mitigation Measures
All waste that will be generated should be contained on vehicles and disposed at the Gobabis landfill site. Waste recycling of solid waste is encouraged to minimise the amount of waste that goes to landfill.

8.2.6 Impacts related to Heritage and Archaeology

Impact Description:
Potential impacts to artefacts may arise from excavation activities.

Mitigation:
There is no known heritage or artefacts that may occur at the project site. If such sites are discovered during the construction phase it is vital that they are reported for possible conservation.

9. Summary and Conclusions

This document highlights the potential impacts for the envisaged development. It can be concluded that if the necessary mitigation measures are implemented the potential impacts associated with the development can be minimized. The intended development will be in close proximity to existing roads, substation and power lines. There will be limited disturbance of new areas.

Key findings of the Environmental Impact Assessment Study indicate that the project can be implemented, provided the recommended control measures are implemented.

- The site intended for the project is not regarded as a sensitive biodiversity area.
- All development have potential negative environmental consequences, but identifying the most important flora species including high risk habitats beforehand, coupled with environmentally acceptable mitigating factors, lessens the overall impact of such development
- The envisaged development will ensure that infrastructure is developed to cater for future power supply requirements in the Gobabis district and Omaheke region.
- The socio economic impacts associated with the scale of this project will not negatively affect Gobabis and the farms lands in the surrounding vicinity.

It is also imperative that Proponent ensures the mitigation measures are incorporated and adhered to. It is therefore recommended that these mitigation measures form part of a legal agreement between the relevant parties.

10. Annexure A: Contour Detailed Survey Drawing

11. Annexure B: Plant Layout Summary

12. Annexure C: Environmental Assessment Practitioner

Alan Jenneker - Resume

PERSONAL DETAILS

Date of Birth:	17 May 1969
Birth Place:	Windhoek
Gender:	Male
Nationality:	Namibian
Marital Status:	Married
Home Language:	Afrikaans
Other Language:	English (speak, read, and write)
Driver's license:	BE (Light vehicle) & A (Motorcycle)
Residential Address:	53 Franke St, Vineta Swakopmund Namibia
Telephone (Home)	+264 64463461
Office:	+264 64404438
Mobile:	+264 811227891

KEY AREAS OF COMPETENCE

- Project Management – (Environmental Management, Safety and Software Implementation projects)
- Management Systems Implementations (ISO 14001 / OHSAS 18001,Namibian Legal Compliance)
- Environmental Assessment Process (Environmental Impact Assessment, Environmental Management Plans and Strategic Environmental Assessments)
- Safety and Environmental Auditing
- Risk Assessments (Safety & Environmental)
- Software & Database Development using MS SQL Server, MS Access & Visual Basic for Applications.

EDUCATION AND TRAINING

- 1990 National Diploma Chemical Engineering: (Cape Peninsula University of Technology- South Africa)
- 1992 Handling of Chlorine Gas (Department Of Water Affairs, Namibia)
- 1995 Environmental Management ISO 14001 Course – Johannesburg, South Africa
- 1996 Arthur D Little HSE Auditor's Course (USA Accredited course) - Swakopmund, Namibia

- 1997 MS SQL Server & MS Access Database developer Course – Windhoek, Namibia
- 2006 IEMA approved Health, Safety and Environmental Auditor (ISO14001 & OHSAS 18001) – Stellenbosch, South Africa

PROFESSIONAL EXPERIENCE

Technical Experience

November 1999 – Current Business Owner, EnviroSolutions Swakopmund

Current Roles and Responsibilities

Business Management	• Project Management • Human Resources Management • Sales and Customer Care • Financial Management and Preparation of financial information – (for financial auditors)
Environmental Impact Assessments (EIA)	• Managing the EIA processes and oversee the development of Environmental Management Plans (EMP's)
Management Systems	• Implementation of management systems using ISO 14001 and OHSAS 18001
Software Development	• Oversee the development of Ms Access, Web based and SQL Server Database projects • Development and maintain various Health, Safety and Environmental databases for a wide range of clients
Weather Monitoring	• Sales, Distribution, Maintenance of Davis weather stations in Namibia Interpretation of weather data and compilation of weather reports

Projects completed during the past 4 years

The projects listed below are some of the key projects that was completed recently.

Project Type	Short Description
Management Systems:	• ERONGO RED: Implementation of ISO 14001 & OHSAS 18001 • INDONGO Toyota: Eco Audit and Implementation of ISO 14001 • GRINROD Terminal – Walvis Bay Port: - ISO 14001 Implementation • AREVA Processing: Assist with the implementation of OHSAS 18001 management system
Audit /Risk Assessment	• Risk Assessment at Namibia Breweries Ltd processing facility • Risk Assessment for Commercial Cold Storage - – Walvis Bay Port • Audits Aquatic Marine Engineer, RJ Southey - Walvis Bay
Environmental Impact Assessments And Environmental Management Plans	• Water front Development: Misty Bay - Walvis Bay • Quarry Activities: Rössing Mountain and the Walvis Bay Municipal area • Tourist Lodges; Sadadi- Okombahe, Ozohere- Uis, • Namibia Poultry Industries: Hatchery, Broiler and Chicken Abattoir • Strategic Environmental Assessment for the coastline between Swakopmund and Walvis Bay • Residential Developments; Finkenstein, Sonnleiten, Henties Bay

	Extension 10 • Exploration and Mining Project EIA's – Otjozondu, Aurum Namibia • Fuel Storage Facility EIA's at Ondangwa, Windhoek, Walvis Bay • Cell phone tower installations in Namibia for AGA Technical Services, MTC Namibia and PowerCom • Sand Mining activities in the Swakop River
Weather Monitoring Instruments– Davis	• Commissioning of various weather stations in Namibia. • Develop a weather database for the weather stations in the Naukluft Park. (The database is primarily used to compile wind roses and provision of the weather statistics) • Maintenance, sales and servicing of weather stations

Other relevant completed in the last 4 years

Project Type	Short Description
EIA and EMP's	• Establishment of a Super Dairy Farm near Mariental, Namibia (*Namibia Dairies* Pty Ltd - O&L)
	• Floating Dry Docks |Walvis Bay, Namibia (Elgin Brown and Hamer)
	• Gypsum Mine Naukluft Park, Namibia (Elspe Minerals)
Coastal Policy Development	• Monitoring and Evaluation Specialist for the NACOMA Project - Swakopmund
Software / Database Development	▪ Development and installation of Radiation Control software for AREVA, ▪ HSE database for Langer Heinrich Mine, ▪ Develop and install HSE databases for Roads Contractor Company and Telecom Namibia

During the last 12 years I have worked on a number of Health, Safety and Environmental projects, as a project manager. The key purpose of the above summary is to indicate my abilities and the level of experience.

COMPUTER LITERACY	
Applications	**Experience Rating**
Microsoft SQL Server	Good
Microsoft Access	Excellent
Visual Basic for Applications	Good
Microsoft Word, Excel, PowerPoint	Excellent
Lakes: Wind-Rose Software	Excellent
Web Site design: Dream Weaver, Page Breeze	Good

PREVIOUS WORK EXPERIENCE

1994 – 1999:
Rössing Uranium Mine, Swakopmund, Namibia: Senior Environmentalist

- Part of the implementation team that was responsible for the implementation of the Environmental Management Systems (ISO 14001)
- Monitoring of environmental aspects e.g., air quality, noise, radiation, fumes and gases
- Safety and Environmental auditing
- Develop and maintain the Environmental, Medical Surveillance and Occupational hygiene databases.

1990 – 1994:
Department of Water Affairs, Windhoek, Namibia: Chemical Technician

- carry out audits at Landfill sites, Mining operations, factories & wastewater disposals facilities in Namibia for water pollution control purposes,(Water Act)

- Provide guidelines to the Government water treatment facilities on effective water purification methods.

1989 – 1990:
Consolidated Diamond Mines, Oranjemund, Namibia: Trainee Metallurgist

- Metallurgical Plant operator in the diamond extraction process

LANGUAGE PROFICIENCY			
	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

REFERENCE

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