

**ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED  
SEEHEIM TELECOMMUNICATION BASE TRANSCIEVER STATION (BTS)  
TOWER AT SEEHEIM, KARAS REGION-NAMIBIA.**

**ENVIRONMENTAL SCOPING REPORT**

**DATE: OCT 2022**

**REFERENCE NUMBER: : 221103000253**



**D&P ENGINEERS  
AND ENVIRONMENTAL CONSULTANTS**  
*"Purpose with Passion"*



**PowerCom  
(PTY) LTD**



# Proposed Construction & Operation of Seeheim Base Transceiver Station Tower - Karas Region: Namibia

## Environmental Scoping Report (ESR)

### Environmental Scoping Report Prepared for Powercom (Pty) Ltd

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## DEFINITIONS

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Plan Report
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
MET: DEA	Ministry of Environment and Tourism's Directorate of Environmental Affairs
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

## **i. Purpose of This Environmental Impact Assessment Report**

This Environmental Scoping Report (ESR) follows the Scope of Work delineated by POWERCOM Pty Ltd. Existing information and input from commenting authorities, Interested and Affected Parties (I&APs) was used to identify and evaluate potential environmental impacts (both social and biophysical) associated with the proposed project.

Environmental flaws associated with the proposed project were identified through the ESR. A conscious decision was made based on the recommendations and guidelines of the Directorate of Environmental Affairs EIA guidelines to assess both significant and less significant environmental impacts proposed by the development. The developed Environmental Management Plan (EMP) for this proposed activity will have to be effectively implemented by the client, to ensure that adverse environmental impacts are not considered.

A detailed assessment of the anticipated impacts was undertaken to highlight any areas of concern regarding the proposed project during its construction, and operation. In addition, an independent sensitivity mapping analysis was undertaken. This analysis characterised the development site on the significant environmental aspects to reflect the site's suitable and unsuitable (no-go) development footprint areas. This action guided the final footprint of the PV Plant and the transmission line.

This report will also be used to motivate and define the previously identified project alternatives (i.e. site, technology, and layout) based on the findings of the environmental baseline study and the suitability of the site to the type of development. This EIAR has been compiled in accordance with the regulatory requirements stipulated in the EIA Regulations (2012), promulgated in terms of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007))

The ESR aims to:

- Provide an overall assessment of the social, physical, and biophysical environments of the area affected by the proposed establishment of the base transceiver station tower (BTS);
- Undertake a detailed environmental assessment, in terms of environmental criteria and impacts (direct, indirect, and cumulative), and recommend a preferred location for the proposed plant (based on environmental sensitivity);

- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- Undertake a fully inclusive Public Participation Process (PPP)
- GIS sensitivity mapping was conducted to identify potential impacts, propose mitigation and inform the sensitivity analysis.

## ii. Assumptions And Limitations

The following assumptions and limitations underpin the approach to this EIA study:

- The information received from the stakeholders, desktop surveys, and baseline assessments are current and valid at the time of the study;
- A precautionary approach was adopted in instances where baseline information was insufficient or unavailable;
- Mandatory timeframes will apply to the review and adjudication of the reports by the competent authority and other government departments; and
- **No land claims have been registered for the proposed site at the onset and registration of the study.**

*NB: The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process. All data from unpublished research utilised for the purposed of this project is valid and accurate. The scope of this investigation is limited to assessing the potential biophysical, social and cultural impacts associated with the proposed project.*



## 1. CHAPTER ONE: BACKGROUND

### 1.1. Introduction

POWERCOM (PTY) LTD herein referred to as the proponent has identified different areas that need improved communication alternatives in Namibia due to the growth in population and economic activities. To achieve the objective of improved telecommunication connectivity, POWERCOM has been appointed by Telecom Namibia, its sister company to establish telecommunication towers across different locations countrywide and Seeheim is one of the areas identified. The development is earmarked to expand connectivity, decongest connectivity and promote ICT in rural and peri-urban environments.

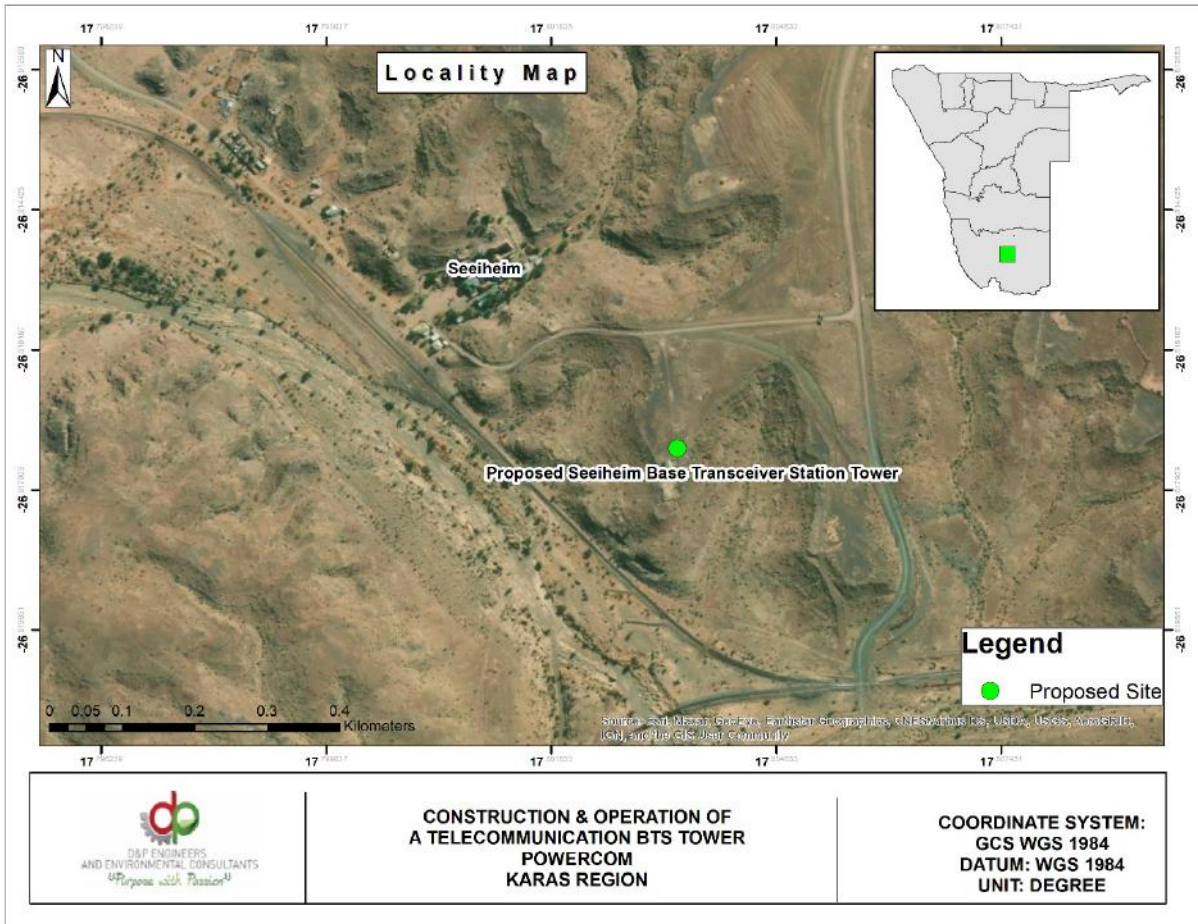
However, the telecommunication towers cannot be constructed without prior consent from interested and affected parties as well as obtaining an Environmental Clearance Certificate for development. In this respect, D&P Engineers and Environmental Consultants cc has been appointed as an Environmental Assessment consultant to carry out an Environmental and Social Impact Assessment study to obtain an environmental clearance certificate as per the requirements of the Environmental Management Act No. 7 of 2007 and Namibian Environmental Impact Assessment Regulations of 2012 in terms of telecommunication infrastructure.

### 1.2. Project Location

The proposed tower is to be erected at Seeheim Hotel, Karas region. The site coordinates are indicated as follows:

- Latitude: 26°49'02.3"S
- Longitude: 17°48'11.5"E

The site is located about +/- 1.21 km from the B4 road and 0.25 km from the C12 gravel road. The site is in the Seeheim Settlement which is close to other tourist attraction area such as the Fish River Canyon, Naute Game Park, Naute Dam, Lüderitz, Kolmanskop, Keetmanshoop & Quiver Tree Forest. The project site is easily accessible by gravel road from the entrance of the seeheim hotel gate. The proposed site is also close to a train station.



**Figure 1: Site Locality**

### 1.3. Project Overview

TELECOM Namibia's information and technology infrastructure development subsidiary, POWERCOM (Pty) Ltd is on a drive of construction network towers across the country. POWERCOM targets that, other than improving internet and voice connectivity in the regions, there is also a need to increase the company's footprint and asset base to best service ICT stakeholders and offer better connectivity in all regions of the country. POWERCOM aims at providing different telecommunication service providers in Namibia with ready-to-use infrastructure as well as expanding network coverage into the different areas where there is weak or no network map connectivity at all.

Behind this backdrop, Telecom identified areas that need improved network connectivity that is currently not serviced with telecom network. The applicant, POWERCOM Pty Ltd, therefore intends to develop 22 telecommunication towers countrywide and Seeheim is one of the planned sites.

The Seeheim BTS development will include the following:

- The project entails the construction of a 30m lattice tower with a footprint size of a 20m x 20m area and a support container;
- The site is to accommodate TN Mobile service and other service providers.
- The structure will be fenced to limit public access to it and it will be electrified to prevent baboons from entering.
- The base station will be a secured building and sufficient precautions will be made to prevent access to the antenna support structure.
- Access to the area will be strictly controlled through a locked gate as illustrated below;

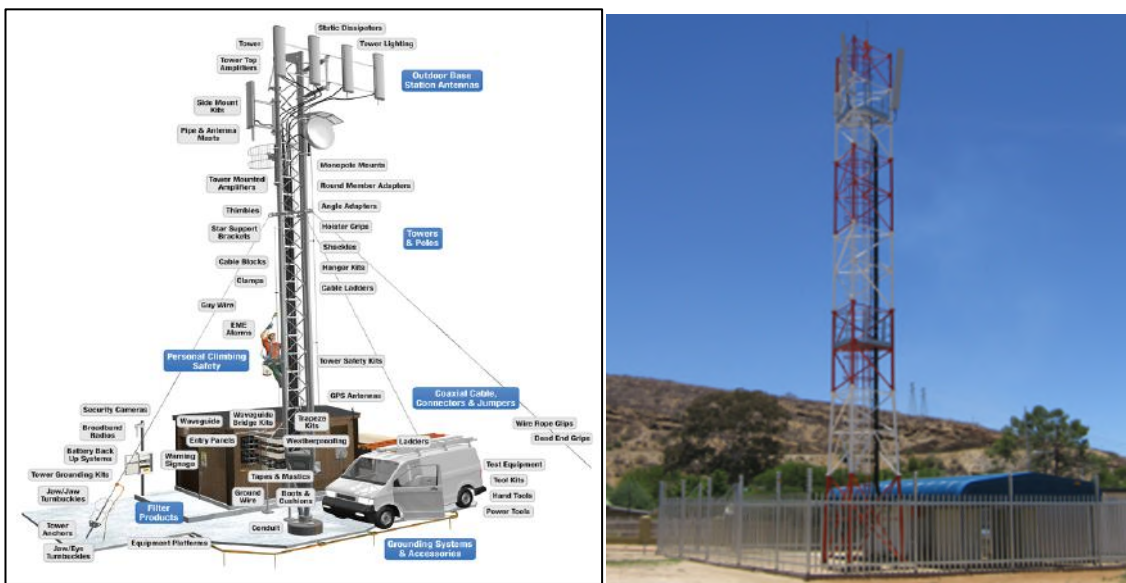


Figure 2: Typical telecommunication towers structure and form (visual purposes only)

### 1.3.1. Accessibility

The project site is easily accessible by gravel road from the entrance of the Seeheim hotel gate. The project site can be seen on the left-hand side as soon as you enter the Seeheim Hotel gate.



### Figure 3: Site accessibility

#### 1.3.2. Infrastructure and Services

- **Water:** Water for construction will be obtained from the existing water infrastructure (Borehole).
- **Ablution:** Construction ablutions will be Seeheim Hotel toilets.
- **Electricity:** There is an existing solar electricity connection for the Seeheim hotel.
- **Communication:** The proposed project will provide for communication in the area.



Figure 4: Solar panel on Seeheim Hotel

#### 1.4. The project Environs

In Karas, the summers are long and hot; the winters are short, cool, and windy; and it is dry and mostly clear year-round. A rainy day is a day on which at least an amount of 0.1 mm precipitation per square meter falls and it consists of an average daily high temperature of only 28 degrees centigrade. The proposed project site is at Seeheim hotel which is on a hilltop. It is 249.56 m, south west of the Spaak River which feeds the Fish river. The area is characterised by rocky soils with few grass and shrubs. The proposed site is close to the train station and Seeheim hotel. The project site is easily accessible by gravel road from the entrance of the Seeheim hotel gate.

#### 1.5. Need and Desirability

The economic and social development goals of Namibia are embodied in (i) Vision 2030 and (ii) the National Development Plan 5 (NDP 5) 2017/2018 – 2021/2022 as well as NDPs 1, 2, 3, and 4. In addition, the Government has developed the Harambee Prosperity Plan (HPP) 2016/2017 – 2019/2020, which complements Vision 2030 and NDP 5. All of the three plans set the goals, targets, and strategy for Namibia to move on a path to economic prosperity through a concerted strategy for the development of Namibia’s economic growth. These



Plans also include specific growth targets, milestones, and strategies for the sustainable deployment of Namibia's resources to achieve the stated economic and social development goals. Communication is one of the major targets aimed in the NDP5 and to stimulate the development of any aspect, internet and voice connectivity is a prerequisite.

This project is a major step in addressing the objectives of the developmental plans and targets of the Namibian government and the development will ensure that there is connectivity for the Seeheim community who will need to keep connected to their business and family.

## **1.6. Project Alternatives**

### **1.6.1. Site Location Alternatives**

An integrated site selection study was done to identify a suitable site for the proposed tower. The proposed site is considered highly desirable due to the following considerations:

- Elevation: The project location is strategic because it can allow the covering of a wider radius within the game reserve.
- Land suitability: The site is easily accessible by road and near an electrical connection to power the tower components.

It is thus, the consideration of the above criteria resulted in the selection of the preferred site. No further site location alternatives are considered in the EIA process.

### **1.6.2. Tower Infrastructure Alternatives**

There are several types of telecommunication towers design and forms. In this respect, to cater for a 20-40m height to make sure network connectivity in Seeheim is good and does not overshoot, the proponent will invest in a Lattice tower.

### **1.6.3. Conclusion**

Based on the preceding alternative analysis and options, the project will go ahead and will ensure maximum environmental and safety performance systems are in place

## 2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

### 2.1. Introduction

An important part of the EIA is identifying and reviewing the administrative, policy, and legislative frameworks concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the proposed project. This section looks at the legislative framework within which the proposed development will conform; the focus is on compliance with the legislation during the planning, construction, and operational phases. All relevant legislations, policies, and international statutes applying to the project are highlighted in the table below as specified in the 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).

**Table 1: Policy, Legal and Administrative Framework**

LEGISLATION/POLICY/GUIDING DOCUMENT	PROVISION	PROJECT IMPLICATION
<b>The Constitution of the Republic of Namibia (1990)</b>	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: <ul style="list-style-type: none"> <li>• Guarding against overutilization of biological natural resources,</li> <li>• Limiting over-exploitation of non-renewable resources,</li> <li>• Ensuring ecosystem functionality,</li> <li>• Maintain biological diversity.</li> </ul>	Through the implementation of the environmental management plan, the proposed development will be conformant to the constitution in terms of environmental management and sustainability, by bringing development in an environmentally sensitive way.
<b>Vision 2030 and National Development Plans</b>	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 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	The proposed project is an important element in the propelling and connectivity in the country.

	pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.	
<b>Environmental Assessment Policy of Namibia 1994</b>	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 tower 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.
<b>Environmental Management Act No. 07 of 2007</b>	The Act aims at <ul style="list-style-type: none"> <li>• Promoting the sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment;</li> <li>• To provide for a process of assessment and control of projects which may have significant effects on the environment;</li> <li>• 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.</li> </ul>	This document is compiled in a nature that project implementation is in line with the objectives of the EMA. EIA guiding procedures developed by MEFT were also used in the course of this project.
<b>Electricity Act 4 of 2007</b>	<ul style="list-style-type: none"> <li>• Requires that any generation and or distribution complies with laws relating to health, safety and environmental standards (s 18(4)(b))</li> <li>• In the event that exemption from acquiring a license is</li> </ul>	Obliges Powercom to comply with all relevant provisions of the EMA and its regulations when installing electrical connections to the tower.

	granted, the Minister may impose conditions relating to public health safety or the protection of the environment.	
<b>The Atomic Energy and Radiation Protection Act, Act 5 of 2005:</b>	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.	Cell phone towers and other antenna installations are usually located on rooftops, towers, and utility poles. Cell phone towers operate at a higher power than cell phones but the radiofrequency EMF they emit is much further away from your body. This means your exposure from such antennas is usually much lower than the exposure level from using a cell phone.  Installation of the network transmitter will be done in accordance with the safety protocols required for non-ionizing radiation protection.
<b>Hazardous Substances Ordinance 14 of 1974 Regulations Made In Terms Of Hazardous Substances Ordinance 14 of 1974 sections 3 and 27</b>	To provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the division of such substances into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances; and to provide for matters connected therewith.	Powercom will have to conform to this Act and its regulations through application for relevant licenses with the relevant bodies highlighted thereto.
<b>“Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300GHz)” (April 1998 developed by the International Commission on Non-Ionizing Radiation</b>	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.	Cell phone towers and other antenna installations are usually located on rooftops, towers, and utility poles. Cell phone towers operate at a higher power than cell phones but the radiofrequency EMF they emit is much further away from your body. This means your exposure from such antennas is usually much lower than the exposure level from using a cell phone.



<b>Protection (ICNIRP)</b>		
<b>Soil Conservation Act 76 of 1969</b>	<p>The objectives of this Act are to:</p> <ul style="list-style-type: none"> <li>• Make provisions for the combating and prevention of soil erosion,</li> <li>• Promote the conservation, protection and improvement of the soil, vegetation, sources and resources of the Republic.</li> </ul>	<p>The project will have a rather localized impact on soils and the soil through clearance for the tower platform. Soil protection measures will be employed and preservation of trees as much as possible.</p>
<b>Protected Areas and Wildlife Management Bill</b>	<p>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 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.</p>	<p>Environmental recommendations and considerations on this project have ensured that the proposed activities will not fall within the boundaries of any protected area and that the project will not affect heavily endangered vegetation and animals on its site.</p>
<b>Forest Act, 2001 (Act No. 12 of 2001)</b>	<p>The Act gives provision for the protection of various plant species through the Ministry of Agriculture, Water and Forestry (MAWF), Directorate of Forestry).</p>	<p>The site has a few palm trees which will not be removed to pave way for development.</p>
<b>National Rangeland Policy and Strategy, 2012</b>	<p>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.</p>	<p>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&amp;5.</p>
<b>National Biodiversity Strategy and Action Plan (NBSAP2)</b>	<p>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.</p>	<p>The project proponent has been advised by DPEE and recognises the need for ecosystem protection to manage the changing climatic environment.</p> <p>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.</p>
<b>Wetland Policy, 2004</b>	<p>The policy provides a platform for the conservation and wise use of wetlands, thus promoting inter-generational equity regarding wetland</p>	<p>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</p>

	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).	the conservation and wise utilization of wetlands resources.  There is an existing water channel within 500m radius of the proposed project site.
<b>Water Resources Management Act, 2013 (Act No. 11 of 2013)</b>	This Act provides for the management, protection, development, use and conservation of water resources. This also forms the regulation and monitoring of water resources.	The proposed development will get water from the existing water infrastructure.
<b>National Heritage Act 27 of 2004</b>	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 older than 50 years, all measures will be taken to protect these objects until the National Heritage Council of Namibia have been informed, and approval to proceed with the operations granted accordingly by the Council.
<b>National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979</b>	“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 (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.	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.

<p><b>Pollution Control and Waste Management Bill</b></p>	<p>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.”</p> <p>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.”</p>	<p>To control air, water and land pollution as agitated by the Act the project proponent will ensure that the development will prevent pollution in all forms during construction and operation phases.</p>
<p><b>Communications Act, 2009 (Act No. 8 of 2009)</b></p>	<ul style="list-style-type: none"> <li>• (10) The Authority may impose specific obligations and requirements on a licensee regarding to masts, towers or other facilities including requirements relating to the</li> <li>• environmental or aesthetic impact of such facilities;</li> </ul>	<p>As a pre requisite, telecommunication towers would require environmental clearance certificates and, in this respect, Powercom authorised this EIA to obtain such.</p>
<p><b>Communication Bill 2009</b></p>	<ul style="list-style-type: none"> <li>• Provide for the regulation of telecommunication activities. The bill provides licencing and enforcement of conditions, and the approval or equipment and technical standards to ensure public health and safety.</li> </ul>	<p>As per relevant spectrum, network equipment should be as per licenses.</p>
<p><b>Convention on Biological Diversity (CBD)</b></p>	<ul style="list-style-type: none"> <li>• Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.</li> </ul>	<p>The project will preserve tree species on as part of their plans for greed and sustainable development.</p>
<p><b>United Nations Convection to combat Desertification</b></p>	<p>Namibia is bound to prevent excessive land degradation that may threaten livelihoods.</p>	<p>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.</p>

### 3. CHAPTER THREE: RECEIVING ENVIRONMENT

#### 3.1. Introduction

In this chapter, the findings of the EIA Team on baseline surveys, public consultation, and desk reviews are undertaken with respect to the ecology, society, economy, and geo-political setup of the proposed project area. The geological makeup and meteorology of the project site will also be discussed in this chapter to give an in-depth understanding of the project area in question.

##### 3.1.1. Socio-Economic status

The proposed project site is at Seeheim hotel a tourist destination area. Due to the few number of people or residents in these areas, economic activity is very low. Apart from the Seeheim Hotel and train station, a nostalgic stopover for tourists on their way to Fish River Canyon, there is a furniture maker. Seheem settlement is close to the Fish River Canyon, Naute Game park, Naute dam, Kolmanskop and Keetmanshoop Quiver Tree Forest.

Due to the dominant economic activity in this area, the proposed tower will have a positive impact as it will improve network connection for businesses or boost business in the areas and, tourists or Seeheim residents will have internet access to communicate with family and friends.



**Figure 5: Existing Land use: Seeheim Hotel**



**Figure 6: Existing Land use on-site- storage room**



**Figure 7: Existing land uses- exploration**

### **3.2. Climate**

Karas is known for its extreme weather since it has a subtropical desert climate. It is located at an elevation of 947.1 meters above sea level which have a yearly temperature of 24.34°C and it is - 0.12% lower than Namibia's averages. Karas typically receives about 18.12 millimeters of precipitation and has 34.64 rainy days (9.49% of the time) annually. Therefore, in Karas, the summers are long and hot, the winters are short, cool, and windy, and it is a dry and mostly clear year round.

### **3.3. Fauna**

Fauna varies depending on the type of vegetation, climate, and topography of an area. The Karas region hosts a variety of large to small games, ranging from Kudu and Springbok to Duiker, Klipspringer, Steenbok, Jackal, and Caracal. The Kudu are abundant among the 'koppies' and roam free, leaping over any fence that may come in their way, whereas the Springbok on the other hand are bound to single encampments because they lack the suppleness and length to jump over



fences. Caracals are widely hunted down by farmers because they prey on the lambs of sheep. Gemsbucks are also widely scattered across the region in addition to Zebra and Red Hartebeest.

However, all of these species were not observed on the specific site due to human presence or infrastructure and the little vegetation on site. Hence, the project will have minimal impacts on fauna.

### 3.4. Avifauna

The Karas area consists mostly of grass-shrubland but you can find trees such as Acacia growing along a water channel or river which play or mostly constitute a suitable area for bird habitation. The type of birds most likely to be found or observed in this area, especially in the lower river is Little Swift, Dusky Sunbird, Speckled Pigeon, Acacia Pied Barbet, Cape Sparrow, and many others.

It is imperative to understand that the specific site consists only of very few grasses and the shrubs are only observed growing along the slope of the hill. There were no trees observed growing close to the site area which might consist of bird nests. The shrubs growing along the slope had no bird nests as well. Therefore no contact will occur with the avifauna; hence the project will have minimal or no impacts on the birds and their habitats.

### 3.5. Flora

Rainfall in Karas is usually both low and extremely variable which means that years of abundant rain are often followed by extremely dry conditions. As a result of low rainfall, vegetation is generally sparse, with few trees and a thin covering of grass. Plant cover varies with rainfall. The Aloe dichotoma or Quiver Tree (Namibia's national tree) is mostly found in Karas. Other plants include the three thorns Rhigozum (Rhigozum trichotomum), various grass species, and species of succulents, such as the Euphorbia. However, most of these species are not present on the site. The area consists dominantly of a few scattered grasses, and the shrubs are only observed growing close to or on the hill slope such as *Boscia foetida*. Hence the project will have minimal impacts on flora, due to the little vegetation observed on the site.



**Figure 8: Overview of vegetation on site**



**Figure 9: Vegetation growing from the slope of the hill close to the site (*Boscia foetida*-right side)**

### **3.6. Hydrology**

The project site is on a hilltop, which is 249.56 m, southwest of the Spaak River which feeds the Fish river and at times of heavy rain forms an island at this juncture. The Skaap River is at a much lower altitude than the site. During the construction phase, it is important to ensure that pollution prevention to prevent runoff pollutants to be washed into the water channel is strictly implemented. Construction is also recommended not to be conducted during the rainy season. The proposed project will have little or no significant impact on general area hydrological drainage, and thus, the project will have a relatively low impact on surface water hydrology.



**Figure 10: View of Skaap river from a hilltop**

### **3.7. Pedology & Geology**

Seeheim is situated within the Nama-Karoo Basin, which is a “large, flat-lying plateau which dominates much of southern Namibia. Sedimentary rocks deposited in the Nama Basin and later in the same area in the Karoo Basin form the foundations of the landscape. The basin slopes from the north, where elevations are about 1,400 m above sea level, to the south, where altitudes are approximately 900 m above sea level. The Fish, Löwen, and Konkiep rivers drain the landscape, all flowing south to the Orange River” (Mendelsohn, 2002). There is no to little vegetation cover in the area because the soil will not be able to provide plants with sufficient water or nutrients. The potential soil impact in the study area is that the soils in the area are susceptible to erosion and



compaction, therefore the disturbance of the soil surface in the vicinity of the project must be minimised to prevent wind erosion. The footprint of the construction area must be kept as small as possible and existing access roads are to be utilised at all times to avoid off-road tracks. The project footprint area should not be cleared entirely and the site should be rehabilitated after the construction phase.



**Figure 11: Soil on site**

### **3.8. Topography**

The project site is on a hilltop, which is 249.56 m, southwest of the Spaak River which feeds the Fish river and at times of heavy rain forms an island at this juncture. Therefore, pollution prevention and stormwater control should be implemented, especially during the rainy season.

### **3.9. Archaeology and Heritage**

According to the National Monuments in Namibia, which is an inventory of proclaimed national monuments, Seeheim is an old German Fortress, Farm Naiams, under chapter 12 of the military fortifications. The San hunter-gatherers are also known for roaming around this area for centuries and there was a possible grave of the san that was observed close to the site area. Therefore, precautions need to be taken during construction, and an accidental find procedure at the subject area may be required.



**Figure 12: Possible grave-San**

### **3.10. Alien Plant Assessment**



The alien plants were considered during the botanical assessment. It was found that no alien plant species were found on site.

## 4. CHAPTER FOUR: PUBLIC CONSULTATION

Public and Stakeholder involvement is a key component of the EA process. The public consultation process, as set out in Section 21 of Regulation No 30 of EMA, has been followed during this assessment, and the details thereof are documented below.

### 4.1. Printed Media

#### 4.1.1. Background Information Document

A Background Information Document (BID) was drafted at the onset of the EA process to act as a useful information handout about the proposed project development. In addition, the BID provided details on the public consultation process with contact details for further information. This document was advertised for availability through various means of newspaper articles, Public meetings, and electronic mail; see Appendix B of this document

#### 4.1.2. Newspaper Advertisements & Articles

Newspaper notices about the proposed project and related Environmental Assessment processes were circulated in two newspapers for two weeks. These notices appeared in the “Confidante” and “New Era” newspapers, shown in Appendix B.

#### 4.1.3. Site Notices

A site notice was placed at the project site, Seeheim entrance, and route to Seeheim. These provided information about the project and related EA while providing contact details of the project team.



Figure 13: Site Notice

#### 4.1.4. Building a Stakeholder Database

A stakeholder database for the project was collected through a variety of means. During the advertisement of the project (through public notices in local newspapers and site notices) the list was augmented as Interested & Affected Parties (I&AP) registered and the contact information of stakeholders was updated, Please refer to Appendix B.

#### 4.1.5. Stakeholder Meetings & Key Conversations

A public meeting was scheduled on Wednesday, 14 September 2022 at Seeheim hotel, and the meeting was attended by the private land owner and his secretary. Appendix b has a detailed list of the attendance register. The consultant administered questionnaires during the meeting to all members who attended the meeting.



**Figure 14: Community engagement meeting conducted**

#### **4.1.6. Comments and review period**

From the onset of the public consultation process and the initial information sharing through the BID, newspaper, and site notices, various stakeholders have registered and provided comments. All who show interest are in support of the initiative. The Scoping Report and Environmental Management Plan were made available to the public and stakeholders for comment and review. Questionnaires and proof of stakeholder engagement are attached in appendix B of this EAR.

## 5. CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

### 5.1. Overview

POWERCOM has committed to sustainability and environmental compliance by coming up with a corrective action plan for all anticipated environmental impacts associated with the project. This is also in line with the Namibian Environmental Management legislation and International best practices on telecommunication infrastructure. The proponent will implement an Environmental Management Plan (EMP) in order to prevent, minimize and mitigate negative impacts. The environmental management plan is being developed to address all the identified expected impacts, the plan will be monitored and updated continuously with the aim of continuous improvement to address impacts.

### 5.2. Assessment Of Impacts

This section sets out the overall approach that was adopted to assess the potential environmental and social impacts associated with the project. To fully understand the significance of each of the potential impacts each impact must be evaluated and assessed. The definitions and explanations for each criterion are set out below in Table 2: Assessment Criteria and

**Table 2: Impacts Assessment Criteria**

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

<b>Duration – What is the length of the negative impact?</b>	
Cumulative	Combined effects of the project with other existing / planned activities
<b>Probability</b>	
Low	<25%
Medium	25-75%
High	>75%

*(Adopted from ECC-Namiba, 2017)*

**Table 3: Impacts Significance**

<b>Class</b>	<b>Significance</b>	<b>Descriptions</b>
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-Namiba, 2017)*



**Table 4: Environmental Impacts and Aspects Assessment**

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure/ Activity
<b>TOPOGRAPHY</b>	Landscape Scenery	Visual aesthetic impact	Construction and Operation	Moderate	Moderate	Local	Direct	Medium 25 - 75%	Minor	Tower construction
<b>SOIL</b>	Soil	Contamination to soil from paints and other potentially hazardous substances	Construction and Operations	Moderate	Small	Local	Direct	Low <25%	Minor	Tower
	Soil	Spillages of fuel, oil and lubricants.	Construction	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
	Soil	Erosion	Construction	Moderate	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
<b>LAND CAPABILITY</b>	Terrestrial ecology	Change in land use	Construction and Operations	Permanent	Great	Local	Direct	Low <25%	Moderate	Tower
	Carrying capacity	Increase in human activities in the environment	Construction and Operations	Moderate	Moderate	Regional	Direct	Low <25%	Minor	Tower
<b>WATER</b>	Surface water quality	Water pollution from oils, lubricants and chemicals spillages.	Construction and Operations	Moderate	Small	Local	Direct	Medium 25 - 75%	Moderate	Construction hydrocarbons
	Surface water quality	Turbidity and high sediment load	Construction	Moderate	Small	Local	Direct	Low <25%	Moderate	Construction hydrocarbons
<b>AIR QUALITY</b>	Air Quality	Construction phase dust	Construction	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
<b>WASTE</b>	Groundwater quality	Hazardous waste such as waste lubricants and stored chemicals may be release into the environment.	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
	Surface water quality	Threatened from chemicals being washed into nearby rivers	Construction and operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate	Tower and Access Road construction
	Surface water quality	Construction and Operational solid waste	Construction and operations	Moderate	Moderate	Regional	Direct	Medium 25 - 75%	Moderate	Tower and Access Road construction and maintenance

Environmental Impact	Valued Ecosystem Component	Impact	Project Phase	Duration	Magnitude	Extent	Type	Probability	Significance	Infrastructure/ Activity
<b>FAUNA</b>	Terrestrial ecology and biodiversity	Loss of habitat and driving away of local animals	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road construction
	Terrestrial ecology and biodiversity	Destruction of vertebrate fauna (e.g. road kills; fence and powerline mortalities)	Construction and Operations	Short	Small	Local	Direct	Low <25%	Minor	Tower and Access Road
<b>SOCIAL</b>	Noise Pollution	Increased noise levels	Construction	Moderate	Small	Local	Direct	Low <25%	Minor	Tower and Access Road
	Socio Economic Activities	Temporary and permanent employment prospects.	Construction and operations	Long	Moderate	Regional	Direct	Medium 25 – 75%	Positive	Tower and Access Road
	Socio Economic Activities	Climate change impacts	Operations	Long	Moderate	Regional / National	Direct	High >75%	Positive	Tower and Access Road
	Contribution to National Economy	Employment, local procurement, duties and taxes.	Construction and Operations	Short	None	Regional / National	Direct	Low <25%	Positive	Tower and Access Road
	<b>HERITAGE</b>	Artefacts, archaeological high value components	Destruction or affecting paleontological and archaeological artefacts	Construction and Operation	Moderate	Small	Local	Direct	Low <25%	Minor
<b>HEALTH AND SAFETY</b>	Health Sanitation	Poor ablution and waste management facilities may be detrimental to human health.	Construction	Moderate	Moderate	Local	Direct	Medium 25 – 75%	Moderate	Tower and Access Road
	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	Warehouse
	Natural Environment	Spillage/ release of chemicals into the environment	Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Tower and Access Road
	Humans, Vegetation, Animals	Potential impacts from non-ionizing radiation propagated by masts.	Operation	Moderate	Small	Local	Direct	Low <25%	Minor	Tower



<b>Environmental Impact</b>	<b>Valued Ecosystem Component</b>	<b>Impact</b>	<b>Project Phase</b>	<b>Duration</b>	<b>Magnitude</b>	<b>Extent</b>	<b>Type</b>	<b>Probability</b>	<b>Significance</b>	<b>Infrastructure/ Activity</b>
<b>AVIAN IMPACTS</b>	Air traffic	Air Traffic disturbances	Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Tower
	<b>Avifauna</b>	<b>Bird fatalities</b>	<b>Operation</b>	<b>Moderate</b>	<b>Moderate</b>	<b>Local</b>	<b>Direct</b>	<b>Medium 25 – 75%</b>	<b>Moderate</b>	<b>Tower</b>
<b>TRAFFIC</b>	Access road	Vehicular accidents	Construction and Operation	Moderate	Great	Local	Direct	Medium 25 – 75%	Major	Tower

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# Environmental Management Plan (EMP)

**ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED  
SEEHEIM TELECOMMUNICATION BASE TRANSCEIVER STATION (BTS)  
TOWER AT SEEHEIM SETTLEMENT, KARAS REGION-NAMIBIA.**

**ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

**DATE: OCT 2022**

**REFERENCE NUMBER: 221103000253**



**D&P ENGINEERS  
AND ENVIRONMENTAL CONSULTANTS**  
*"Purpose with Passion"*



**PowerCom  
(PTY) LTD**



# Proposed Construction & Operation of Seeheim Settlement Base Transceiver Station Tower in Seeheim Settlement - Karas Region: Namibia

## Environmental Management Plan (EMP)

### Prepared for Powercom (Pty) Ltd

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**Reference Number: : 221103000253**

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Date: 26-Oct-22

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## DEFINITIONS

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Plan Report
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
MEFT: DEA	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change



# 1. CHAPTER ONE: BACKGROUND

## 1.1. Introduction

Powercom (PTY) LTD herein referred to as the proponent has identified different areas that need improved communication alternatives in Namibia due to the growth in population and economic activities. To achieve the objective of improved telecommunication connectivity, Powercom has been appointed by Telecom Namibia, its sister company to establish telecommunication towers across the identified different locations countrywide. The development is earmarked to expand connectivity, decongest connectivity and promote ICT in rural and peri-urban environments.

However, the telecommunication towers cannot be constructed without prior consent from interested and affected parties as well as obtaining an Environmental Clearance Certificate for development. In this respect, D&P Engineers and Environmental Consultants cc has been appointed as an Environmental Assessment consultant to carry out an Environmental and Social Impact Assessment study to obtain an environmental clearance certificate as per the requirements of the Environmental Management Act No. 7 of 2007 and Namibian Environmental Impact Assessment Regulations of 2012 in terms of telecommunication infrastructure.

## 1.2. Legal or compliance requirements

As per the requirements of the Environmental Management Act No. 7 of 2007 and the Environmental Assessment regulations of 2012, Powercom has appointed D&P Engineers and Environmental Consultants (DPEE) to conduct an Environmental Assessment (EA) and develop an Environmental Management Plan (EMP) for the proposed tower establishment. Therefore, this report presents the EMP which has been undertaken in accordance with these requirements. As such, key requirements in accordance with this Act classify the proposed project as listed and invoke the need for an environmental management plan to sustainably implement this project. However, legal compliance is not only limited to the EMA, but also applies to all applying legal requirements identified in the ESR. When licenses are required such as wastewater discharge, the proponent should ensure that all licenses and permits are obtained and fulfilled as per conditions.

In accordance with the two acts stipulated above, the application for the Environmental Clearance Certificate (ECC) will be obtained from the Ministry of Environment, Forestry, and Tourism (MET): Directorate of Environmental Affairs (DEA) before the project can proceed. In this respect, this document forms part of the application to be made to the DEA's office for an Environmental Clearance certificate for the proposed telecommunication tower at Seeheim Settlement , in accordance with the guidelines and statutes of the Environmental

Management Act No.7 of 2007 and the environmental impacts regulations (GN 30 in GG 4878 of 6 February 2012).

### **1.3. Other Legislation And Conventions**

In addition to the Environmental Assessment Policy and the Environmental Management Act, the following additional pieces of existing or pending legislation and conventions may have some bearing on the proposed project:

The socio-economic environment

- Atomic Energy and Radiation Protection Act (2005)
- Communal Land Act (2002)
- Decentralisation Policy (1998)
- Hazardous Substances Ordinance (1956)
- International Atomic Energy Agency Non-proliferation Treaty (1970)
- Labour Act (1992)
- National Employment Policy (1997)
- National Heritage Act (2004)
- Pending Minerals Safety Bill
- Public Health Act (1919)
- Regional Councils Act (1992) as amended
- Road Traffic and Transport Act (1999)
- Traditional Authorities Act (1995)
- War Graves and National Monuments Amendment Act (1986)

The biophysical environment

- Air Quality Act (2004)
- Atmospheric Pollution Prevention Act (1965)
- Atmospheric Pollution Prevention Ordinance (1976)
- Convention on Biological Diversity (2000)
- Convention to Combat Desertification (1997)
- Forestry Act (2001)
- Minerals Policy of Namibia (2003)
- Namibian Water Corporation Act (1997)
- Nature Conservation Ordinance (1975) and Nature Conservation Amendment Act (1996)
- Pollution and Waste Management Bill (draft)
- Ramsar Convention (1975)
- Soil Conservation Act (1969)
- United Nations Framework Convention on Climate Change (1992)
- Water Resources Management Act (2004)

## 2. CHAPTER TWO: PROJECT DESCRIPTION AND LOCATION

### 2.1. Project Location

The proposed tower is to be erected at Seeheim Hotel, Karas region at coordinates, 26°49'02.3"S 17°48'11.5"E. The site is located about +/- 1.21 km from the B4 road and 0.25 km from the C12 gravel road. The site is in the Seeheim Settlement which is close to other tourist attraction areas such as the Fish River Canyon, Naute Game Park, Naute Dam, Lüderitz, Kolmanskop, Keetmanshoop & Quiver Tree Forest. The project site is easily accessible by gravel road from the entrance of the Seeheim hotel gate. The proposed site is also close to a train station.

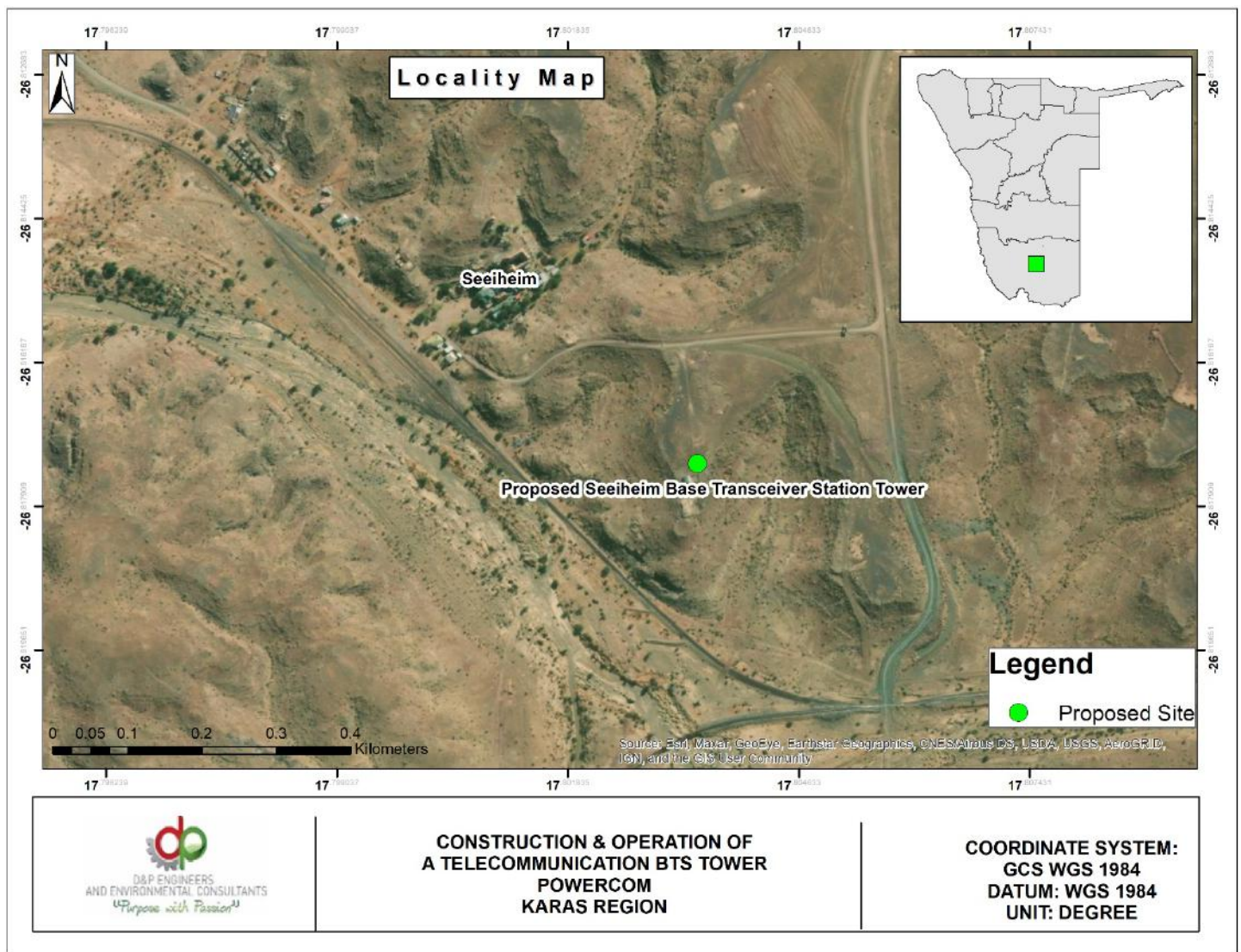


Figure 1: Site Locality

### 2.2. Brief Description Of The Environment

In Karas, the summers are long and hot; the winters are short, cool, and windy; and it is dry and mostly clear year-round. A rainy day is a day on which at least an amount of 0.1 mm precipitation per square meter falls and it consists of an average daily high temperature of only 28 degrees centigrade.



The proposed project site is at Seeheim hotel which is on a hilltop. It is 249.56 m, southwest of the Spaak River which feeds the Fish river. The area is characterised by rocky soils with little grass, but shrubs are observed growing as you move toward the edges of the hill, they grow along the steep slope. According to the National Monuments in Namibia, which is an inventory of proclaimed national monuments, Seeheim is an old German Fortress, Farm Naiams, under chapter 12 of the military fortifications. The San hunter-gatherers are also known for roaming around this area for centuries and there was a possible grave of the san that was observed close to the site area. However, the area has been disturbed by human activity, such as exploration activity, and infrastructures.



**Figure 2: Description of the area**



**Figure 3: Possible grave-San**

### **2.3. Description And Design of the project**

TELECOM Namibia's information and technology infrastructure development subsidiary, POWERCOM (Pty) Ltd is on a drive of construction network towers across the country. POWERCOM targets that, other than improving internet and voice connectivity in the regions, there is also a need to increase the company's footprint and asset base to best service ICT stakeholders and offer better connectivity in all regions of the country. POWERCOM aims at providing different telecommunication service

providers in Namibia with ready-to-use infrastructure as well as expanding network coverage into the different areas where there is weak or no network connectivity at all. Behind this backdrop, Telecom identified areas that need improved network connectivity that is currently not serviced with telecom network. The applicant, POWERCOM Pty Ltd intends to develop 22 telecommunication towers countrywide and Seeheim Settlement being one of the sites.

Each tower development will include the following:

- The project entails the construction of a 30 lattice tower with a footprint size of a 20m x 20m area and a support container;
- The site is to accommodate TN Mobile service and other service providers.
- 20m x 20m electric fence

The Proposed tower position will entail:

- The structure is to be fenced to limit public access to it.
- The base station will be a secured building and sufficient precautions will be made to prevent access to the antenna support structure.
- Access to the area will be strictly controlled through a locked gate.

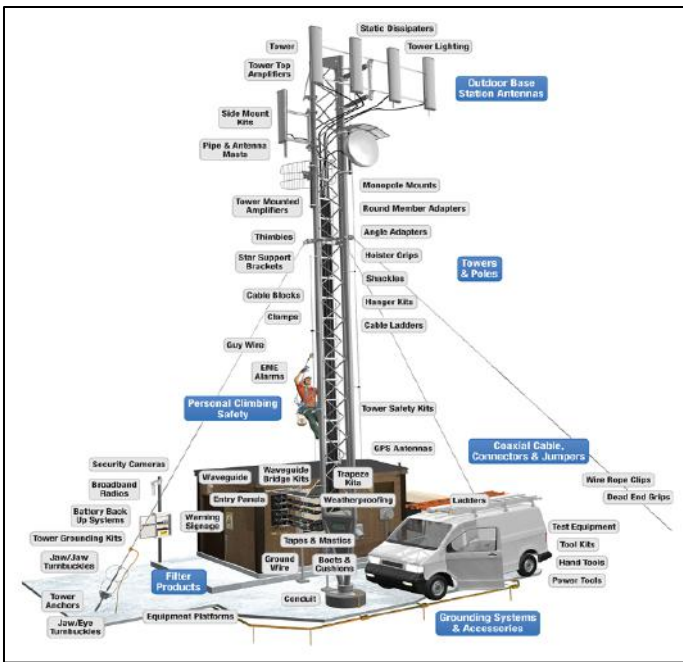


Figure 4: Typical telecommunication towers structure and form (visual puproposes only).

### **3. CHAPTER THREE: ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

#### **3.1. Purpose Of The Environmental Management Plan (Emp)**

This EMP has been developed for the proposed establishment of a telecommunication base transceiver station at Seeheim Settlement. It forms the operational framework within which the proposed project is to operate within. All anticipated environmental and social impacts identified in the environmental scoping report are addressed, with a mitigation action, monitoring requirements, key indicators, and responsibilities. The purpose of this document is therefore to guide environmental management throughout the following life-cycle stages of the proposed development, namely planning and design, construction, operation, and maintenance. All this life-cycle has been addressed in this EMP (see table 2&3). This EMP is incessant, and it requires compliance monitoring, updating, and or amendment if the scope of operations changes. All personnel working on the project will be legally required to comply with the standards set out in this EMP.

Furthermore, this section describes the Environmental Management Plan (EMP) for impacts associated with the proposed development. The EMP stipulates the management of environmental programs in a systematic, planned, and documented manner. The EMP below includes the organizational structure, planning, and monitoring for environmental protection at the proposed farm area development and other areas of its influence. The aim is to ensure that the proponent maintains adequate control over the project operations to

- To prevent negative impacts where possible;
- Reduce or minimize the extent of impact during the project life cycle;
- Prevent long-term environmental degradation.
- Ensure public safety and health are protected

#### **3.2. EMP Administration**

There is a strong need to clearly outline the roles and responsibilities of all stakeholders to ensure that the EMP is fully implemented. To ensure that the EMP is effectively implemented, the consultant also recommends that MET: DEA also conduct regular inspection visits on-site to enforce conducting of quarterly and biannual reports. Furthermore, there is also a need for the proponent to appoint an overall responsible person (project manager) to ensure the successful implementation of the EMP.

### 3.3. Roles and Responsibilities

**Table 1: EMP Implementation-Roles and Responsibilities**

ROLE	ENVIRONMENTAL RESPONSIBILITIES
Powercom Pty Ltd (Site Acquisition Manager)	Responsible to enforce EMP implementation during construction and operation phases.
Environmental Control Officer (ECO)	Implement, review and update the EMP. <ul style="list-style-type: none"> <li>• Ensure all reporting and monitoring required under EMP is undertaken, documented, and distributed as needed</li> <li>• Conduct environmental site training (toolbox talks) and inductions with the support of an environmental consultant.</li> <li>• Conducts environmental audit at the work site with the support of an environmental consultant.</li> <li>• Close out all non-conformances.</li> <li>• Ensure materials being used on site are environmentally friendly and safe.</li> </ul>
The Directorate of Environmental Affairs	Approve the EMP and any amendments to the EMP. <ul style="list-style-type: none"> <li>• Approve reports of environmental issues and non-conformances as issued.</li> <li>• Review and approve environmental reports submitted as part of EMP implementation</li> <li>• Ensure that the client is compliant with the EMP through biannual reporting on environmental performance.</li> </ul>
Project Manager (Site Engineer)	Control and monitor actions required by the EMP. <ul style="list-style-type: none"> <li>• Report all environmental issues to HSE Manager.</li> <li>• Ensure documented procedures are followed and records are kept on site.</li> <li>• Ensure any complaints are passed on to the management within 24 hours of receiving the complaint.</li> </ul>

Contractor	<p>Follow requirements as directed by the EMP when conducting work.</p> <ul style="list-style-type: none"> <li>Report any potential environmental issues to site engineer/project manager, indicating spilt oil, excess waste, excessive dust generation, dirty water running off the site and other possible non-conformances</li> </ul>
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### 3.4. Planning and design

**Table 2: Planning and Design Management Actions**

Aspect	Management Requirement	Responsibility	Timeframes
<b>Tower Design</b>	<ul style="list-style-type: none"> <li>The design standards to be applied for the Tower should comply with the internationally accepted public exposure guidelines.</li> <li>The tower design should comply with the aesthetic guidelines for similar structures as prescribed by the City of Windhoek.</li> </ul>	Proponent	Pre-construction phase
<b>Labour Recruitment</b>	<ul style="list-style-type: none"> <li>It is anticipated that POWERCOM will utilize its own workforce. However, should there be the need to employ an extra person(s), especially for unskilled labour, it is highly recommended to recruit local people from Seeheim Settlement .</li> </ul>	Proponent	Ongoing
<b>Surrounding property owners</b>	<ul style="list-style-type: none"> <li>Consent letters are to be obtained from the surrounding property owners before construction.</li> </ul>	Proponent	Pre-construction phase



<b>Construction schedule</b>	<ul style="list-style-type: none"> <li>A convenient construction work/schedule should be prepared and shared with the surrounding property owners. This will ensure that the surrounding property owners are aware of when to expect the construction team at the site.</li> </ul>	Proponent	Pre-construction
<b>Compensation of land</b>	<ul style="list-style-type: none"> <li>There needs to be a clear agreement between POWERCOM and the land owners if they will be compensated for the piece of land used before construction starts.</li> </ul>	Proponent	Pre-construction

### 3.5. Construction and Operation

**Table 3: Construction and Operation EMP (C&O EMP)**

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
<b>Noise pollution</b>	<p>Noise will be generated through:</p> <ul style="list-style-type: none"> <li>Construction activities</li> <li>Moving vehicles.</li> </ul>	<p>The health of working personnel could be disturbed.</p> <p>Seeheim Settlement residents and learners could be disturbed by the noise.</p> <p>General annoyance</p> <p>Driving away local animals species near the project site</p>	Environmental	4-6 months	<p>Environmental Control Officer</p> <p>Site Manager</p>	<p>A construction interval will be established, used, and adhered to.</p> <p>Workers will be issued earplugs to protect them from excessive noise.</p> <p>The public will be notified through a printed timetable stating planned operational activities.</p> <p>Construction activities will be conducted during the daytime.</p>	Construction & Operation

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
						<p>Site notices will be erected on, around the site-notifying visitors, and nearby residents of different hazards on site.</p> <p>No areas marked as sensitive environments, especially for birds, need to be avoided during construction and operation.</p>	
<b>Dust Generation</b>	Dust will accumulate because of the land preparation, onsite movements of vehicles and machines, wind blowing on loose material during construction, and tipping.	<p>This can lead to respiratory illnesses, especially among those working in the area.</p> <p>General air pollution.</p> <p>Nuisance to nearby residents</p> <p>The process can also drive away wild animals within the project area's surroundings</p>	Environmental	6-8 months	<p>Environmental Control Officer</p> <p>Site Manager</p>	<p>Dust suppression will be done by watering dust source surfaces.</p> <p>Watering down dusty surfaces,</p> <p>Ensure that protective equipment such as respirators are distributed to employees, and ensure their use.</p> <p>Site notices are to be erected on and around the site to inform visitors and surrounding residents.</p>	<b>Construction &amp; Operation</b>
<b>Loss of Biodiversity</b>	<p>Vegetative plants on site will be removed</p> <p>Habitat destruction for both ground-dwelling species and tree-dwelling species.</p> <p>-Soil disturbance on and around the site.</p>	<p>The clearing of vegetation will result in the breaking of the ecosystem processes in the area.</p> <p>Loss of aesthetic value of the proposed project area.</p> <p>The few small animals still habiting the place such as small rodents and birds will be forced away.</p>	Environmental	Constr uction phase	<p>Environmental Control Officer</p> <p>-Site Manager</p>	<p>The proposed project area is already disturbed; hence there is little vegetation to be affected by the development.</p> <p>The ground disturbance will only be limited to the boundary area to avoid affecting a large area.</p> <p>Upon completion of construction activities more greening of the construction footprint affected area is recommended.</p>	Construction

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
						A local landscaper can be engaged.	
<b>GhG emissions</b>	<p>Green House Gasses (GHGs) emissions will be produced from the following activities:</p> <ul style="list-style-type: none"> <li>Fuels combustion for (construction vehicles and equipment)</li> <li>Ground excavation releases phosphorus found underground and releases particulate matter into the atmosphere.</li> </ul>	<p>Global climate change</p> <p>Air pollution</p>	Environmental	Construction phase	<p>Environmental Control Officer</p> <p>Site Manager</p> <p>Department of Environmental Affairs.</p>	<p>Adopt the use of ethanol-blended fuels wherever necessary.</p> <p>Design an operating system that cuts on fuel consumption.</p> <p>Use of solar energy systems during construction for lighting and other minor energy needs.</p>	Construction & Operation
<b>Waste Generation</b>	<p>Construction and operation are associated with a lot of raw materials and activities that result in pollution</p> <p>The construction and maintenance activities may generate e-waste</p>	<p>Pollution from oil spills resulting from the handling of various machinery used during the construction phase</p> <p>Construction rubble, empty packaging containers/bags, and materials remnants.</p>	Environmental	Construction phase	<p>Environmental Control Officer</p> <p>Site Manager</p>	<p>Ensure that all waste from construction activities is stored and contained in designated containers and transported to an approved waste disposal site.</p> <p>Bulky waste such as building rubbles must be collected and disposed of for landfilling.</p> <p>-Visual inspections monitoring</p>	

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
	and this needs to be disposed of sustainably.						
<b>Safety and Health risks</b>	Construction related Safety and Health hazards	Injuries to workers such as Occupational dermatitis, slips and falls of humans and objects, musculoskeletal disorders, etc.	Health and Safety	Construction phase	ECO	Equip workers with Personal Protective Equipment (PPE), and provide training on how to effectively use the PPE.  Provide platforms for briefings and meetings about possible safety and health hazards in the workplace Provide site signs warning and informing about different hazards on site.	Construction and operation
	Electrical hazards	Fatalities and fires	Health and Safety	Construction and operation	ECO	Employees should be trained on electrical safety before working on-site.  Safety representatives with training on electrical hazards and emergency management should be a station on-site always during construction  Safety signs during construction and operation should be put on site. No-go areas should be labeled, and PPE specifications should be clear to maintenance personnel.	Construction and Operation
	Radiation (Non-ionizing)	Carcinogenic consequences	Health  Social	Permanent	Environmental Control Officer  Site Manager	Radiation is the emission of energy as electromagnetic waves or as moving subatomic particles and it is part of our everyday environment (Clegg et al., 2019).  Non-ionizing radiation encompasses both	<b>Operation</b>

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
						<p>natural and human-made sources of electromagnetic fields, for example, electrical power supplies and appliances are the most common sources of low-frequency electric and magnetic fields in our living environment (ITU-T, 2014).</p> <p>The contractors to be installing the transmission are required to put on appropriate PPE to protect them from possible radiation.</p> <p>Provisions of the Atomic Energy and Radiation Protection Act, 2005 (Act No. 5 of 2005) should be effectively implemented, and 20 days before installation of the transmitters, communication should be made to the Radiation Protection Authority for authorization and supervision.</p>	
	Avifauna	Bird fatalities	Environmental	Permanent	Environmental Control Officer  Site Manager	<p>Towers will be built below 40m in height which will avoid bird fatalities.</p> <p>Construct towers, away from areas of high migratory bird traffic, wetlands, and other known bird areas.</p> <p>Minimize the tower 'footprint' on newly constructed towers.</p> <p>If the tower is decommissioned, it should</p>	Operation

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
						<p>be removed as soon as possible.</p> <p>Use visual daytime markers in areas of high diurnal birds.</p> <p>Security lighting for on-ground facilities should be minimized, point downwards, or be down-shielded.</p> <p>Conduct on-site bird fatalities monitoring on the tower at least every month.</p> <p>The use of white strobes results in less circling behavior by nocturnal migrants and thus less mortality than red pulsating lights.</p>	
	Aviation Impacts	<p>Bird fatalities</p> <p>Air transports impacts</p>	<p>Socio-economic</p> <p>Environmental</p>	Permanent	<p>Environmental Control Officer</p> <p>Site Manager</p>	<p>The towers should comply with aviation guidelines so that they do not impact air transport systems.</p> <p>Air traffic visibility systems such as lighting at the tip of the tower.</p> <p>The towers should be designed so that they are visible to birds.</p>	Construction and operation
<b>Land use change</b>	There will be change in land use and visual aesthetics	Sudden changes in landscape appearances may be unfavorable for Seeheim Settlement residents.	<p>Social</p> <p>Terrestrial environment</p>	Permanent	<p>Environmental Control Officer</p> <p>Site Manager</p>	The development should blend into the existing area through designing and color coding.	Construction and operation
Positive Impacts							

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
<b>Employment creation</b>	The development provides an opportunity of outsourcing work	Improves disposable income for those employed and their immediate families.	Socio-economic	Project lifetime	Site Manager	Work with local leadership (councilor) on acquiring non-skilled labor from the residents.	Construction and operation
<b>Business linkages</b>	Raw materials acquiring and contracting companies provide an opportunity for businesses.	Local suppliers will be presented with an opportunity to empower their businesses.  Construction workers can be provided with accommodation, food, and services from the local community increasing business activities.	Socio-economic	Construction phase	Site Manager	The proponent will outsource most of its materials and services	Construction and operation
<b>Infrastructure development</b>	The development presents a unique opportunity for infrastructure	Improvement in connectivity.  Boost in Local	Socio-economic	Construction phase	Site Manager	The new tower should cover a larger area, and they should also consider the provision of infrastructure platforms to other	Construction and operation

## 4. CHAPTER FOUR: CONCLUSION AND RECOMMENDATIONS

### 4.1. Recommendation from Environmental Assessment Practitioner

Based on the information provided it is the opinion of D & P Engineers and Environmental Consultants cc that no fatal flaws have been identified for the proposed development and that the information contained in this report is sufficient enough to allow DEA to make an informed decision.

The Environmental Consultant, therefore, recommends that Environmental Clearance be granted for the proposed development based on the following recommendations:

- The proposed activity is not anticipated to have significant environmental impacts.
- There is however a visual impact.

The following recommendations should be implemented to ensure that potential impacts associated with the establishment and operations of the site are minimised:

- Any areas disturbed during construction and operation must be rehabilitated.
- The structure was to be removed when the structure ceased to be used for telecommunications purposes and the site was rehabilitated.
- Construction is to take place during working hours.
- Trampling and disturbance associated with construction should be limited to within 5m (five meters) of the footprint of the site.
- Provisions of the Atomic Energy and Radiation Protection Act, 2005 (Act No. 5 of 2005) should be strictly abided to.
- On completion of the project, all litter and construction debris shall be immediately removed from the site.
- Mitigation measures to reduce the potential visual impact should be implemented as far as possible.
- Precautions need to be taken during construction due to the possibility of the area being a heritage site, and an accidental find procedure at the subject area may be required.



# Appendices