DRAFT ENVIRONMENTAL MANAGEMENT PLAN (EMP):

THE CONSTRUCTION AND OPERATION OF A 30M LATTICE TELECOMMUNICATION TOWER AT OSHAKATI INDEPENDENCE STADIUM IN OSHAKATI , OSHANA REGION

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Author(s): **Ms. Aili Iipinge** Company: **Excel Dynamic Solutions (Pty) Ltd** Telephone: **+264 (0) 61 259 530** Fax2email: **+264 (0) 886 560 836** Email: **public@edsnamibia.com**	Prepared For: **PowerCom (Pty) Ltd**

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
3G/4G	Third and fourth generation of wireless mobile telecommunications technology
CRAN	Communications Regulatory Authority of Namibia
DEAF	Department of Environmental Affairs and Forestry
EA	Environmental Assessment
ECC	Environmental Clearance Certificate
EDS	Excel Dynamic Solutions
ESIA	Environmental and Social Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
IAPs	Interested and Affected Parties
ICAO	International Civil Aviation Organisation
ICNIRP	International Commission on Non-Ionizing Radiation Protection
MEFT	Ministry of Environment, Forestry and Tourism
MHSS	Ministry of Health and Social Services
MICT	Ministry of Information and Communication Technology
NAMCARS	Namibia Civil Aviation Regulations
NCAA	Namibia Civil Aviation Authority
NRPA	National Radiation Protection Authority of Namibia
PPE	Personal Protective Equipment
Reg, S	Regulation, Section

1 INTRODUCTION

1.1 Project Background

Namibia is experiencing a rapid increase in the use of mobile communication services, which has led to a rise in local pressure for efforts to expand on telecommunications infrastructure, in order to promote and facilitate local access to telecommunication services. PowerCom (Pty) Ltd (The Proponent) has identified the need for a 30 m high Lattice telecommunication tower in the area of Oshakati Independence Stadium in Oshakati to improve network coverage in the area. This proposed development is aimed at ensuring that the quality of service provided to telecommunication service users in the area is enhanced.

The Proponent proposes to erect and operate a 30 m high lattice telecommunication (network) tower with an outdoor cabinet next to the tower. The total surface area of the site dedicated to tower footprint is approximately 100 m^2. The remainder of the site is for storage of the operational and maintenance equipment. The location of the proposed network tower construction project is shown in **Figure 1.**

Telecommunication towers and related infrastructure developments are among listed activities that may not be undertaken without an Environmental Clearance Certificate (ECC) under the Environmental Management Act (EMA) (2007) and its 2012 Environmental Impact Assessment (EIA) Regulations. The relevant listed activities as per EIA regulations are:

- *10.1 (g) The construction of masts of any material or type and of any height, including those used for telecommunication, broadcasting, and radio transmission.*

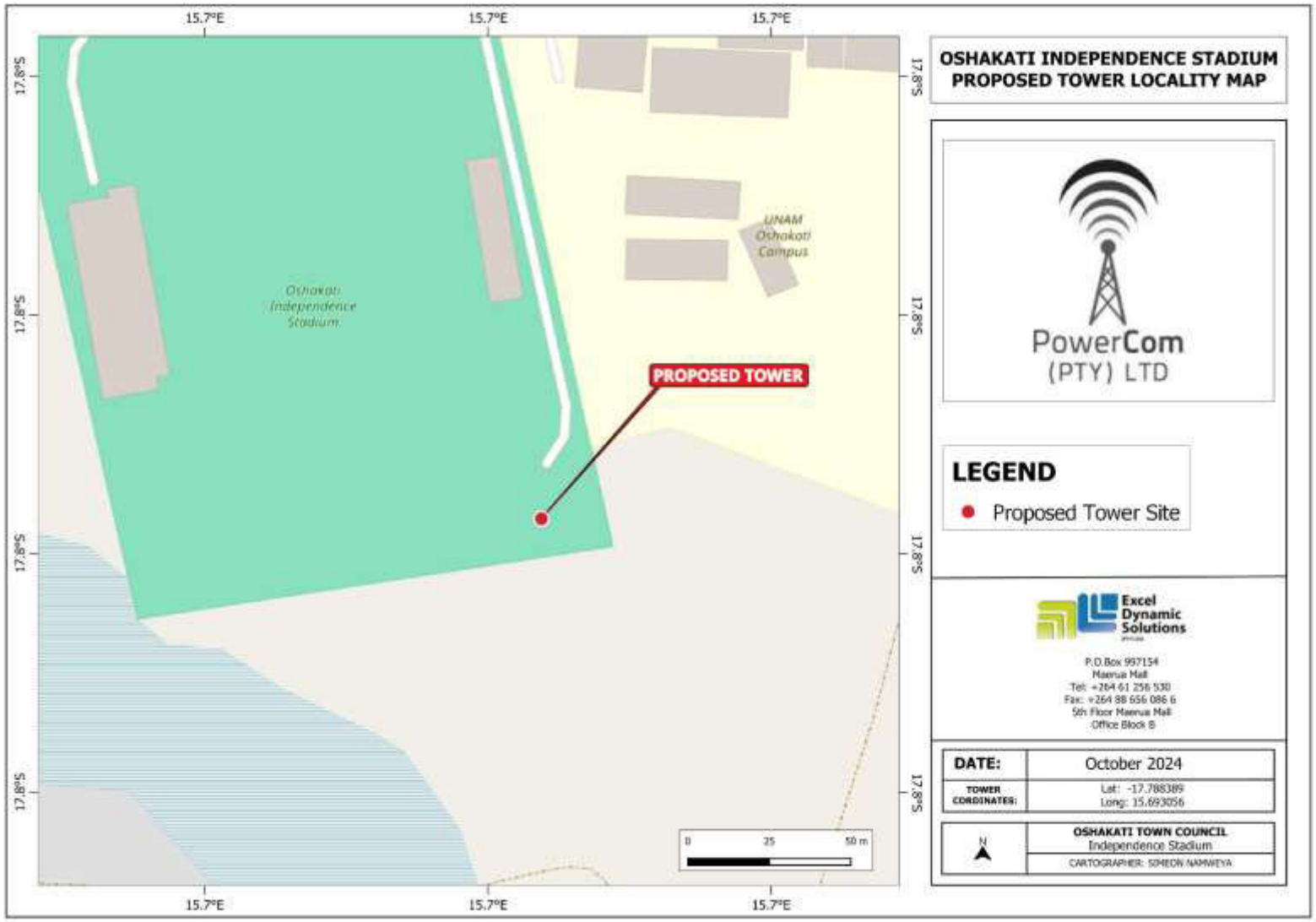

Figure 1: Locality map – Oshakati Independence Stadium- Tower site

1.2 Ownership of the Proposed Site

The anticipated network shortfalls to mobile users in the area triggered this site selection. The outcome of the selection criteria used provided the best potential positions of the tower in Oshakati Independence Stadium, Oshakati West constituency.

The proposed site (location) is under the ownership of PowerCom, through a land use (leasehold) agreement to occupy the land for the purpose of constructing and operating a tower, granted by the management of town planning of Oshakati town council and the management of Oshakati Independence Stadium.

1.3 Appointed Environmental Consultant and ECC Application

To ensure that the proposed activity is compliant with the national environmental legislation, the project Proponent had to appoint an independent environmental consultant, Excel Dynamic Solutions (Pty) Ltd, to undertake the required Environmental Assessment (EA) process (which entailed the compilation of this EMP) and apply for the ECC on their behalf.

The ECC application is compiled and submitted to the Competent Authority (Ministry of Information and Communication Technology (MICT)). Upon submission of an Environmental Social Impact Assessment Report and Draft Environmental Management Plan (EMP), an ECC for the proposed project may be considered by the Environmental Commissioner at the MEFT's Department of Environmental Affairs and Forestry (DEAF).

1.4 The Aim of the Draft Environmental Management Plan (EMP)

Regulation 8(j) of the EIA Regulations (2012) requires that a draft Environmental Management Plan (EMP) shall be included as part of the Environmental Assessment (EA) report. A 'Management Plan' is defined as:

"…a plan that describes how activities that may have significant environments effects on the environment are to be mitigated, controlled and monitored."

An EMP is one of the most important outputs of the EA process. It synthesizes all the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. An EMP provides a link between the impacts identified in the EA process and the required mitigation measures to be implemented during operation. It is important to note that an EMP is a statutory

document and a person who contravenes the provisions of this EMP may face imprisonment and/or a fine. This EMP is a living document and can be amended to adapt to address project changes and/or environmental conditions and feedback from compliance monitoring.

The purpose of the EMP is to ensure that the proposed project activities are undertaken in an environmentally friendly and sustainable manner, through effective implementation of the recommended environmental management and mitigation measures. The aim is to avoid and or minimize the adverse impacts, while maximizing the positive impacts.

2 LEGAL OBLIGATIONS GOVERNING THE PROPOSED ACTIVITIES

Upon issuance of an ECC and obtaining any other necessary and required documentation, the Proponent will prepare for the construction of the tower.

The construction and operation, as well as maintenance of the telecommunication tower and associated activities will need to adhere to certain local, regional, national as well as international legal standards. The legal requirements provided in the EMP are those related to permitting/licensing, i.e., permits or licensing that the Proponent will need to obtain prior to commencing with construction, and operations and/or renewal of permits throughout the operational phase of the tower. These legal requirements are provided under **Table 1**.

Table 1: Applicable and required permits/authorizations/licenses for the tower and its associated activities

Legislation/Policy/Guideline	Relevant Provision	Implication for the Project and Contact Institution/Person
Environmental Management Act (EMA) No. 7 of 2007	The Act requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27). The Act details principles which are to guide all EAs.	The EMA and its regulations should inform and guide this EA process. Should the ECC be issued to the Proponent, it should be renewed every 3 years, counting from the date of issue. Contact details at the Department of Environmental Affairs and Forestry (DEAF), Ministry of Environment and Tourism (MET) **Office of the Environmental Commissioner** Tel: +264 (0) 61 284 2701
Environmental Impact Assessment (EIA) Regulations Government Notice 28-30 (Government Gazette 4878))	Details requirements for public consultation within a given environmental assessment process (Government Notice 30 Section 21). Details the requirements for what should be included in an EA Report (Government Notice 30 Section 8) and an Assessment Report (Government Notice 30 Section 15).	
Communications Act No. 8 of 2009	All the relevant communications operations' permit and license (broadcasting) should be applied for and obtained from the relevant regulatory authorities. The Proponent should comply with the relevant Sections of Part 5 of the Act. This Part (Special Rights of Carriers). The Sections that will apply to the proposed project are Section 59(1) and (3), 60: Entry upon and construction of lines across any land, 64(1): Fences, 64(2), 66(1): Height or depth of cable and facilities, and 66(2) and 66(3).	**Contact: Communications Regulatory Authority of Namibia (CRAN),** Tel.: +264 61 222 666, **Ministry of Information and Communications Technology** **Tel.: 061 283 2676**

Legislation/Policy/Guideline	Relevant Provision	Implication for the Project and Contact Institution/Person
Atomic Energy and Radiation Protection Act No. 5 of 2005	The Proponent should ensure that they have applied for and obtained all the required licenses for operating the tower in accordance with the Non-ionising Radiation Regulations (2019).	For the determination of possible exposure, the Proponent should consult with the Ministry of Health and Social Services' National Radiation Protection Authority. **National Radiation Protection Authority** **Tel.: 061 203 2417**
"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 Protection (ICNIRP)).	To determine the "safe distance" around the site. These provisions justify the need for assessing the impact of electromagnetic radiation from the antennae, on the nearby residents.	
Civil Aviation Act No. 6 of 2016	The heights of the proposed telecommunication tower might be a threat to the nearest aerodrome site. Therefore, the Proponent should verify these prior to construction with the Namibia Civil Aviation Authority (NCAA).	The site is located about 24 km from the nearest aerodrome point (Andimba Toivo ya Toivo Airport). The contact details at the NCAA to verify and advice on the construction of the tower in the area with regards to the aviation sector are as follow: **Aerodromes and Ground Aids Section** **Tel.: +264 83 235 2361**
Convention on International Civil Aviation, Annex 14	• Annex 14 to the Convention on International Civil Aviation. • Chapter 4: Obstacle restrictions and removal • Chapter 6: Visual aids and donating of obstacles	

Legislation/Policy/Guideline	Relevant Provision	Implication for the Project and Contact Institution/Person
Forestry Act 12 of 2001, Amended Act 13 of 2005	Prohibits the removal of any vegetation within 100 m from a watercourse (Forestry Act S22 (1)). The Act prohibits the removal of and transport of various protected plant species.	Should there be protected plant species, which are known to occur within the actual project site footprints and require to be removed, a Permit should be obtained from the nearest Forestry office (Ministry of Environment, Forestry and Tourism (MEFT)) in Windhoek prior to removing them. MEFT Forestry Division **Tel: +264 (0) 61 2087663**
National Heritage Act (Act No. 27 of 2004)	The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration, or excavation of heritage sites or remains, while Section 48 sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council. Section 51 (3) sets out the requirements for impact assessment. Should any objects of heritage significance be identified during the site clearing and excavations, the	National Heritage Council of Namibia (NHC) Regional Heritage Officers at the NHC **Tel: +264 (0) 61 301 903**

Legislation/Policy/Guideline	Relevant Provision	Implication for the Project and Contact Institution/Person
	work must cease immediately in the affected site and the necessary steps taken to seek authorisation from the Council.	
The National Monuments Act No. 28 of 1969	The Act enables the proclamation of national monuments and protects archaeological sites.	
The Road Traffic and Transport Act No. 52 of 1999 and its 2001 Regulations	Provides for the control of traffic on public road and the regulations pertaining to road transport, including the licensing of vehicles and drivers.	Roads Authority- specialist Road legislation), Tel: +264 (0) 61 284 7072

3 DRAFT EMP IMPLEMENTATION, ROLES & RESPONSIBILITIES

As the project Proponent, PowerCom is ultimately responsible for the implementation of the EMP. However, they may delegate this responsibility at any time, as they deem necessary during the project phases (usually to an environmental control officer or safety, health, and environmental person). The roles and responsibilities of all the parties involved in the effective implementation of this EMP are as follows:

3.1 Competent Environmental Monitoring Authority (DEAF of the MEFT)

The Department of Environmental Affairs and Forestry (DEAF) of the Ministry of Environment, Forestry and Tourism (MEFT) as the environmental custodian is responsible for enforcing compliance with the EMA, its regulations and full implementation of this EMP. The authority is also responsible for the reviewing of bi-annual reports submitted by the Proponent and grant ECC renewal after every 3 years following an environmental audit.

Further Monitoring institutions include:

- The National Radiation Protection Authority of Namibia (NRPA): for electromagnetic emissions.

3.2 Project (Site) Manager

Project or Site Manager (as appropriate) is responsible for ensuring that project activities are completed on time, efficiently and sustainably. The manager's duties and responsibilities will include:

- Ensure that relevant commitments contained in the EMP Action Plans are adhered to.
- Ensure the relevant staff is trained in procedures entailed in their duties.
- Maintain records of all relevant environmental documentation for the project.
- Through consultations and cooperation with the ECO/SHE officer, issuing fines to individuals who may be in breach of the EMP provision and if necessary, removing such individuals from the site.
- Cooperate with all relevant interested and affected parties/stakeholders.
- Development and management of schedules for daily activities in compliance with the EMP.
- Ensuring compliance with relevant environmental and related authorisations and license conditions.

- Identifying and appointing of appropriately qualified specialists (were necessary) to undertake the programmes in a timeous manner and to acceptable standards.

3.3 Construction Contractor

The Contractors' representative or site supervisors (as appropriate) is required to:

- Ensure that the relevant commitments contained in the EMP Action Plans are adhered to.
- Compile relevant procedures and method statements for approval by the applicable phase site manager prior to initiation of project activities on the site.
- Ensure that all relevant staff are trained in procedures.
- Maintain records of all relevant environmental documentation applicable to their work.

3.4 Safety, Health and Environmental or Environmental Control Officer

The Proponent may assign the responsibility of ensuring EMP compliance throughout the project life cycle to a designated member of staff or external qualified and experienced person, referred to in this EMP as the Environmental Control Officer (ECO) or Safety, Health & Safety (SHE) Officer. The ECO/SHE Officer has the following responsibilities:

- Ensure that relevant commitments contained in the EMP Action Plans are adhered to.
- Planning and carrying out site inductions to the workers on-site and visitors to the work area of the site.
- Maintain records of all relevant environmental documentation for the project.
- Reviewing the EMP annually and amending the document when necessary.
- Management and facilitation of communication between the Proponent, and Interested and Affected Parties (IAPs) regarding this EMP.
- Conducting site inspections (recommended frequency is monthly during the construction phase and bi-annually for the operation and maintenance) of all areas with respect to the implementation of this EMP (monitor and audit the implementation of the EMP).
- Advising the Proponent on the removal of person(s) and/or equipment not complying with the provisions of this EMP.
- Making recommendations to the Proponent with respect to the issuing of fines for contraventions of the EMP.
- Undertaking an annual review of the EMP and recommending additions and/or changes to this document.

4 ENVIRONMENTAL MANAGEMENT & MITIGATION ACTION PLANS

The environmental management and mitigations measures (management plan actions) provided to the potential negative impacts associated with the proposed project and its activities are presented under this chapter. The aim of these plan actions is to avoid these potential impacts where possible, and where impacts cannot be avoided, measures are provided to reduce the impacts' significance.

4.1 Key potential Negative/ (Adverse) Impacts

The summary of key identified potential negative impacts for which the mitigation measures have been developed are as follows:

- **Physical (land/soil) disturbance:** excavation activities to erect the tower could potentially lead to site soils' disturbance.
- **Loss of Avifaunal Biodiversity**
- **Noise:** During tower' construction, the presence of the construction team and movement of heavy vehicles and machinery may disturb the immediate neighbours to the site.
- **Visual impact:** The presence of the tower in the neighbourhood may be a nuisance to locals.
- **Potential occupational health and safety risks** associated with mishandling of tower construction and operations equipment.
- **Impacts to Human Health:** Electromagnetic Radiation emitted from the antennae of cellular structures may affect human health.
- **Civil Aviation concerns:** The proposed site designs and location need to be verified to ensure that it meets the approval of the Directorate of Civil Aviation regarding the height of the masts and the position and stability of transmitters.
- **Environmental pollution/Waste generation** from improper disposal of waste generated during construction and maintenance phases.
- **Dust Generation** from construction works and vehicular traffic
- **Archaeological or cultural heritage impact** through unintentional uncovering of archaeological objects on site.

4.2 The Management and Mitigation of Potential Key Negative Impacts

The management and mitigation measures (action plans) for the potential adverse impacts are presented in **Table 2** for the planning & design, construction, and subsequent operational and maintenance phases.

There will be some overlaps with regards to some potential impacts' occurrence during the construction and operational phases, therefore potential impacts have not been separated for these project phases. The required management and mitigation plan actions have been presented together with key performance indicators, responsible person(s), resources and the timeline of such actions. These aspects form the headings of **Table 2,** and they are as follows:

- Environmental aspect and issues for which management actions are required.
- Proposed impact mitigation measures.
- Key performance indicator (KPI) for monitoring success levels of management actions.
- Responsible person(s) for implementing the proposed management actions.
- Resources required for implementing management actions and monitoring.
- Implementation timeframes for the proposed management actions.

Table 2: Management and Mitigation Measures for the Planning & Design, Construction and Operational & Maintenance Phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
PLANNING & DESIGN PHASE						
EMP implementation and training	Lack of EMP awareness and implications thereof	-A Comprehensive Health and Safety Plan for the project activities should be compiled. This will include all the necessary health, safety, and environmental considerations applicable to respective works on site. -An EMP non-compliance penalty system should be implemented on site. -The Proponent should appoint a SHE Officer to be responsible for managing the EMP implementation and monitoring.	-All required Plans and systems are compiled and in place Safety, Health and Environmental (SHE) Officer is appointed -Records of EMP implementation Plans and Systems -An SHE officer or ECO is appointed	-Proponent	-Independent Environmental Consultant: EMP compliance and auditing -DEAF: site inspections for compliance -Identification of all persons involved in the implementation of the EMP	Pre-Construction
Authorizations	Lack of Permits/ Licenses	-All the required agreements and licenses or permits should be applied for and obtained The permits, agreements referred to herein include: ○ Environmental Clearance Certificate (ECC)	-Applicable permits and licenses to obtained from relevant authorities and kept on site for records keeping and future inspections	-Proponent	-Record of permits and authorizations obtained	Prior to construction and operations

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		○ Power supply agreements from Oshakati Independence Stadium and Oshakati Town Council. ○ Finalizing leasehold agreements from the Oshakati town council management ○ Waste disposal authorization from the Municipal Council.				
Telecommunication permit	Lack of necessary project authorization	-A telecommunication licence and other relevant communications authorisations should be applied for and obtained from the Communications Regulatory Authority of Namibia (CRAN).	-All the relevant licenses obtained and documented	-Proponent	-Not applicable	Pre-construction phase

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-The Proponent should comply with the relevant Sections and Parts of the Act, and of importance is Part 5 of the Act. This Part (Special Rights of Carriers). The Sections that will apply to the proposed project are **Section 59(1) and (3), 60: Entry upon and construction of lines across any land, 64(1): Fences, 64(2), 66(1): Height or depth of cable and facilities, and 66(2) and 66(3).**				
Tower design	Tower design failure during operations and public exposure	-The design standards to be applied for the tower and its supporting structures should comply with the internationally accepted public exposure guidelines. **Please consult with the National Radiation Protection Authority of Namibia.**	-The design according to the international approved standards	Planning & Design Engineer With the guidance or recommendations from the National Radiation Protection Authority (NRPA) of Namibia	Not applicable	Pre-construction phase

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
Visual (sense of place)	Visual nuisance	-All the necessary options to improve the aesthetic of the site should be considered so that it blends in with the surrounding areas or at least enhance the areas to a better appeal to the locals and neighbours. The tower and equipment storage parameters to be considered here are colour, scale, design, and height.	-The parameters of the tower designed to reduce the visual impact	-Proponent -Planning & Design Engineer	Not applicable	Pre-construction phase
Civil aviation	Impact on aerodrome points	-The proposed tower design and location need to be verified to ensure that it meets the approval of the Namibia Civil Aviation Authority's Regulations (NAMCARS) regarding the tower height and the position in the area. -The Civil Aviation Act No. 6 of 2016 for setting up mast structures in Namibia should be complied with.	-Sufficient consultations done with the NCAA and NAC, and approval/consent provided (if needed)	-Proponent -NCAA	Not applicable	Pre-construction and operations

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-Civil Aviation Standards of the International Civil Aviation Organisation (ICAO) pertaining to the tower should be adhered to.				
Construction	Nuisance associated with poorly planned construction times	-A convenient construction work / schedule should be prepared and be shared with the neighbouring property owners around Oshakati Independence statidium . This will ensure that the locals/neighbours are aware of when to expect the construction team on site. -Construction activities should be restricted to weekdays i.e., Mondays to Fridays and during working hours (08:00 - 17:00) only.	-Notification submitted to the Oshakati Independence stadioum And Oshakati Town council Management on time -Clear posters erected on site	-Proponent -Construction contractor	-Notices of work schedule	Pre-construction
Communication between the	Lack of communication	-The Proponent should appoint a Public Relation Officer (PRO)	-A PRO is appointed	-Proponent -PRO	-Grievance logbook	Pre-construction and throughout

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
Proponent and surrounding land users	(proper liaison) between surrounding land users (communities) and Proponent	to liaise with neighbouring land users (home and or property owners), when needed and required. -A clear communication procedure/plan which should include a grievance mechanism should be compiled.			-PRO appointment -PRO contact details to be provided to the affected residents -Local land users/ communities	the subsequent phases
Employment	Creation of employment opportunities	-Priority for non-skilled labour should be given to people from around the respective site, in accordance with procedures approved by the relevant authorities. -Equal opportunity should be provided for both men and women.	-Number and residence of locals employed	-Construction Contractor -Site Manager	-Record of employees -Constituency Council office to assist in identifying unemployed people -Notification via the Constituency Office	Pre-construction activities
Specialised procurement of services	Design, construction contractors, and services	-All services related to project activities such as construction related works that the Proponent may need, preference should be given to local providers of such services. If not available locally, the services search should be extended to a regional level	-Number of local hired contractors	-Proponent -Construction Contractor	-Record of hired or contracted companies or services providers	Pre-construction As and when required for maintenance.

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		(Oshana Region) and lastly, nationally, or international, if all efforts lead to no success.				
CONSTRUCTION AND OPERATIONAL & MAINTENANCE PHASES						
EMP implementation and training	Lack of EMP awareness and implications thereof	-EMP trainings should be provided to all new workers on site. -All site personnel should be aware of necessary health, safety, and environmental considerations applicable to their respective work -The implementation of this EMP should be monitored. -The site should be inspected, and a compliance audit done throughout **the project as recommended below:** ○ **Daily - construction phase** ○ **Bi-annually – for operations** -An EMP non-compliance penalty system should be implemented on site.	-Compliance monitoring conducted daily during construction -Bi-annual compliance for operations -Timely renewal of the Environmental Clearance Certificate (ECC) every 3 years	-Proponent -SHE Officer	-Monitoring reports ECC renewed on time. -Records of EMP training conducted	Throughout the construction and operation phases
Communication between the Proponent and	Lack of communication (proper liaison) between	-A clear communication procedure/plan which includes a	-PRO is appointed and part of the project personnel	-Proponent -PRO	-Grievance logbook	Communication to run throughout the project phases.

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
surrounding land users	surrounding land users and Proponent	grievance and response mechanism should be compiled.			-surrounding land users/ communities	
Soils	Site soils (land) disturbance Soil erosion	-The topsoil that was stripped from certain site areas to enable construction works should be levelled to reduce erosion. -All possible trenches excavated for construction on site should be backfilled. -Soils that are not within the intended footprints of the site areas should be left undisturbed. -Project vehicles/machinery should stick to temporary access roads provided and or meant for the project works to avoid compaction of the soils on the site and its surroundings. -In an event that any of the substances mentioned above, spill on the soil, the contaminated soil should be cleaned up immediately and dispose of in designated hazardous waste bins and then to an approved landfill site.	-Record evidence of new erosion gullies (photographs) - No visible oil spills on the ground or contaminated/pollution spots owing to construction activities.	-Construction contractor -SHE Officer -Proponent	-Tipper trucks and excavators to backfill trenches	Throughout the construction phase operational phase

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
Electromagnetic radiation	Human health	-The Proponent should ensure that the tower construction and its EMR are within the international standards of The Atomic Energy and Radiation Protection Act, Act 5 of 2005 and Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (April 1998 developed by the International Commission on ICNIRP). -The National Radiation Protection Authority should be involved during the operational phase to assess the possible emissions from the tower. -Familiarize with the gazetted Non-ionising Radiation Regulations, 2019: Atomic Energy and Radiation Protection Act, 2005.	- Consultation with the NRPA	-Proponent -NRPA	Exposure Guidelines and 2019 Non-ionising Radiation Regulations, 2019: Atomic Energy and Radiation Protection Act, 2005	Throughout the operational phase, as and when required
Civil aviation	Impact on aerodromes	-Comply with the guidelines and condition set forth by the NCAA under the Planning & Design phase.	-Consultation with the NCAA	-Proponent -NCAA	-Relevant guidelines	Throughout the operational phase
Visual	Visual nuisance	-The Proponent should use the camouflaged tower to blend in with their surroundings, thus reducing visual nuisance.	-Parameters to improve the sense of place incorporated into	-Proponent -Planning & Design Engineer	None	Pre-construction and operational phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-All the necessary options to improve the aesthetic of the site should be considered so that it blends in with the surrounding area or at least enhance it for a better appeal to the public.	the design and implemented			
Biodiversity	Loss of Fauna and Flora	**Flora:** -The Proponent should avoid unnecessary removal of vegetation, to promote a balance between biodiversity and project activities. **Avifauna (Birds)** -Although there are already other structures around the area that could already be contributing to the impact (such as existing powerlines), the cumulative impacts of the new tower in relation to the existing powerlines and associated structures in the area are an important consideration to minimize the impact on birds. -Migratory bird attraction and energy costs can be further minimized by eliminating continuously burning security lights under tower. Many tower operators use down-shielded,	-Keep record of names of all protected plant species identified prior to site clearing. -No disturbance to unmarked site areas.	-The Proponent -Site Manager and Construction contractor -SHE Officer	-Barricading tape (to indicate working areas) -Ministry of Environment, Forestry and Tourism (MEFT)	-Throughout the phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		motion sensor-triggered security lighting, which promotes tower safety, reduces energy costs, and reduces the possibility of attracting migratory birds. -Flashing lights would minimize migratory bird collisions and maintain aircraft safety while decreasing tower lighting costs and maintenance costs. -Other proper measures on minimizing bird mortalities by the telecommunication tower should be developed and implemented.				
Air Quality	Air quality (dust)	-Construction and delivery vehicles should not drive at a speed more than 40 km/h on unpaved/untarred roads to avoid dust generation around and within the site areas. -The Proponent should ensure that the construction work schedule is limited to the given number of days of the week to keep the vehicle-related dust level minimal in the area. -Dust control measures such as reasonable amount of water spray should be used on gravel	-Dust suppression measures implemented -Visible efforts to curb dust	-Proponent -SHE Officer -Construction Contractor	-Grievance logbook -Dust suppression water tanks	Throughout the construction phase

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		roads and near specific exposed areas of work on site to suppress the dust that may be emanating from certain project activities on site. -Dust masks, eye protective glasses and other respiratory personal protective equipment (PPE) such as face masks should be provided to the workers carrying out potential dust generating activities such as excavation, where they are exposed to dust.				
Waste management	Environmental pollution	-Biodegradable and non-biodegradable wastes must be stored in separate containers and collected regularly for disposal at a landfill in (in Oshakati, upon reaching an agreement with the Town council of Oshakati). -Any hazardous waste that may have an impact on the physical and social environment should be handled cautiously and disposed of carefully at the nearest approved waste management facilities of the Town.	-A register of all waste generated on site is kept on site. -All waste disposal permits from relevant authorities are available on site. -No littering on and around the project site	-Proponent -Site Manager -Construction Contractor -SHE Officer	-Funds to acquire waste storage bins/ drums; and transport all waste from the site. -Waste storage containers	Throughout the phases.

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-Workers should be sensitized to dispose of waste in a responsible manner and not to litter. -No waste may be buried or burned on site or anywhere else in the environment, apart from authorized and approved waste management site. -There should be separate waste bins for hazardous and general/domestic waste in both construction as well as the operational and maintenance phases until such that time it will be transported to designated waste sites. -Sewage waste should be managed as per the portable chemical toilets' manufacturer's instructions and regularly disposed of at the nearest treatment facility				
Noise	Noise	-Noise from vehicles and equipment on site should be reduced to acceptable levels. -Construction and operational hours should be restricted to between 08h00 and 17h00 to avoid noise by vehicles and	-Weekdays activities during construction -PPE provided to workers operating noisy equipment and in noisy site areas.	-Site Manager -SHE Officer -Construction Contractor	-Clearly written placards with construction hours in a day placed at one of the access roads to the site	Throughout construction

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		equipment before working or after hours to avoid noise generated by equipment and the movement of heavy vehicles, thus affecting neighbours. -When operating excavators and other noise generating machinery on the site, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce exposure to excessive noise.				
Health, Safety and Security	General health and safety associated with project activities	-The Labour Act's Health and Safety Regulations should be complied with. -All items for treatment as specified in the material safety data sheets (MSDS) for hazardous materials shall be available in the first aid kit. -Keep a standard first aid kit at the site. -Establish an emergency rescue system for the evacuation of injured people, if needed. -Emergency procedures for accidents shall be communicated to all workers.	-Compilation of Comprehensive Health and Safety Plan.	-Proponent -Site Manager -SHE Officer -Construction Contractor	-Health and Safety Policies	Prior to site setup activities and throughout the phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-Ensure that all workers know where the first aid kits are located and who is trained in administering in first aid. -As part of their induction, the project workers should be provided with an awareness training of the risks of mishandling equipment and materials on site as well as health and safety risk associated with their respective jobs. -Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible. -An emergency preparedness plan should be compiled, and all personnel appropriately trained. -Workers should not be allowed to drink alcohol prior to and during working hours as this may lead to mishandling of equipment which results into injuries and other health and safety risks. -The site to be equipped with "danger" or "cautionary" signs				

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		for any potential danger or risk area identified. -A security guard or guards should be part of the team so that they can look after the project equipment and vehicles that would be left on site in weekends or public holidays (when no work is done) to ensure that no unauthorized person enters the area.				
	Occupational Health and Safety	-When working on and moving around the site, employees and visitors should be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc depending on the project phase. -The Proponent must avail adequate and appropriate PPE to all workers and visitors. -Timeously recording and reporting of all health and safety incidences.	-Regular health screening of workers -Bi-annual health and safety audits done. -All onsite workers and visitors equipped with PPE.	-Site/Project Manager (holds overall responsibility) -SHE Officer	-Funds to acquire health and safety related equipment. and to pay for employee medical services -First Aid training for at least 1 personnel at each work site	Throughout the project phases and when required
Health and safety	Accidental fire outbreak	-Portable fire extinguishers should be provided on site.	-No Fires recorded (due to presence of workers)	-Site Manager -SHE Officer	-Fire extinguishers (1 per vehicle) and	Throughout construction and operational phases

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		-No open fires to be created by project personnel. -Potential flammable areas and structures should be marked as such with clearly visible signage.			1 per working site	
Archaeology and heritage	Accidental disturbance and destruction of archaeological or heritage objects and sites	-Caution should be exercised when carrying out excavations associated with the project activities if archaeological/heritage remains are discovered. -Identified of any archaeological significant objects on the site should not be disturbed but are to be reported to the project Environmental/Safety officer or National Heritage Council offices for further instructions and actions. -Workers should be educated to not destroy or throw away but report (to the environmental/Safety officer) of any unknown object found/discovered on site. -The worksite manager should familiarise themselves with the National Heritage Council's Chance Find Procedure (please refer to **Appendix 1 of this**	-Preservation of all artefacts that are discovered around project area -Cessation of work upon discovery/unearthing of unknown objects	-Site Manager --Construction Contractor -SHE Officer -Archaeologist	-Salvage equipment -Flag tapes -GPS (site marking) -Technical Staff/Consultant (Archaeologist to help identify and advise on heritage object discovery)	As and when required, prior to site setup activities and upon encounter. -Archaeologist to be present during the earth workings

Aspect	Impact	Management & Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Person	Resources	Timeline
		document) and if uncertain about the procedure should receive training by a suitably qualified archaeologist with respect to the identification of archaeological/heritage remains and the procedures to follow if such remains are discovered throughout the project activities' duration.				

APPENDIX 1: CHANCE FINDS PROCEDURE (AFTER KINAHAN, 2020)

Areas of proposed development activity are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found during development work. The procedure set out here covers the reporting and management of such finds.

Scope: The "*chance finds*" procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): "*a person who discovers any archaeological …. object ……must as soon as practicable report the discovery to the Council*". The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

Responsibility:

Operator: To exercise due caution if archaeological remains are found.

Foreman: To secure site and advise management timeously.

Superintendent To determine safe working boundary and request inspection.

Archaeologist To inspect, identify, advise management, and recover remains.

Procedure:

Action by person identifying archaeological or heritage material.

a) If operating machinery or equipment stop work

b) Identify the site with flag tape

c) Determine GPS position if possible

d) Report findings to foreman

Action by foreman

a) Report findings, site location and actions taken to superintendent

b) Cease any works in immediate vicinity

Action by superintendent

a) Visit site and determine whether work can proceed without damage to findings

b) Determine and mark exclusion boundary

c) Site location and details to be added to project GIS for field confirmation by an archaeologist

Action by Archaeologist

a) Inspect site and confirm addition to project GIS

b) Advise NHC and request written permission to remove findings from work area

c) Recovery, packaging and labelling of findings for transfer to National Museum

In the event of discovering human remains

a) Actions as above

b) Field inspection by archaeologist to confirm that remains are human

c) Advise and liaise with NHC and Police

d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

The competent authorities' contact details to report archaeological sites or objects (site manager and contractor) are as follows:

- National Heritage Council (NHC) of Namibia (061 244 375) or direct contact with the Regional Heritage Officers at the NHC 061 301 903
- National Museum (+264 61 276800),
- National Forensic Laboratory (+264 61 240461).