ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED TELECOMMUNICATION TOWER AT MAFUTA COMBINED SCHOOL, ZAMBEZI, REGION-NAMIBIA.

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

DATE: JAN 2025
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D&P ENGINEERS
AND ENVIRONMENTAL CONSULTANTS
"Purpose with Passion"

PowerCom
(PTY) LTD



Proposed Construction & Operation of Mafuta Combined School Telecommunication Tower – Zambezi Region: Namibia

Environmental Management Plan (EMP)

Prepared for Powercom (Pty) Ltd

P.O. Box 40799
Ausspannplatz
Windhoek
Namibia

D&P Engineers and Environmental Consultants (Pty) Ltd.

20 Joseph Ithana Mukwayu street
Ludwigsdorf
Windhoek-Namibia
PO Box 8401, Bachbrecht,
Telephone: +264 (61) 302 672/ 081299 8444
https://www.facebook.com/DP-Engineers-and-Environmental-Consultants-193970370936785/

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Compiled by:

D&P Engineers and Environmental Consultants
(Pty) Ltd
Email: tkasinganeti@dpe.com.na

Authors:
Erikka N Mokanya
Tendai E. Kasinganeti

Approved: Tendai E. Kasinganeti – Lead EAP

Date:

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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, a sister company to establish telecommunication towers across different locations countrywide and Mafuta Combined School is one of the location that has been 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. 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 classifies 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 for 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 Mafuta Combined School, 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 Mafuta Combined School, Zambezi Region at coordinates, (17°32'40.0"S, 24°18'54.5''E). The site is located about 7km south of central Katima Mulilo through the Mafuta – Katima Mulilo back road.

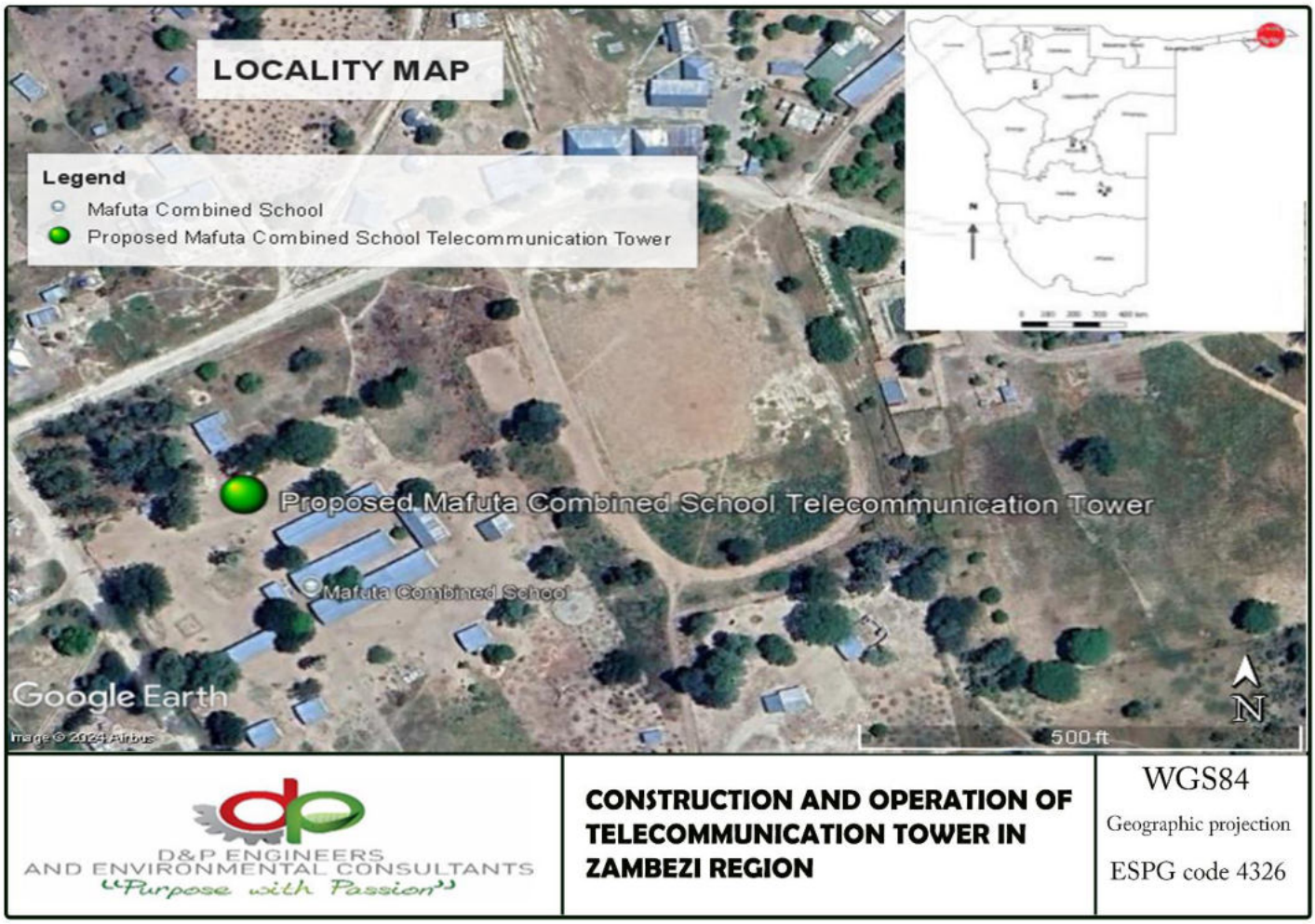

Figure 1: Site Locality, arial photography, Mafuta Combined School Telecommunication Tower.

2.2. Brief Description Of The Environment

Mafuta Combined School has a subtropical climate characterized by distinct wet and dry seasons. The wet seasons in this area runs from November to March with rainfall averages between 600 mm and 1,000 mm annually. Like the rest of the region, Mafuta Combined School has a high humidity level supporting agriculture and the growth of lush vegetation. Average maximum temperatures are between 32°C and 34°C, while the average minimum temperatures are between 2 and 4°C. The proposed area's general vegetation is characterized with:

- A fairly homogenous Kalahari Woodland comprising of broadleaved deciduous forests (Mopane, Zambezi teak, wild seringa
- Alluvial soils found along riverbanks and flood plains.

- Sandy soils, which are found predominantly in upland areas away from the floodplain, well-drained but low in nutrients
- Clayey soils mainly found in lower-lying areas that retain water for extended periods.
- The site is close to residential homesteads, the presence of wild fauna is not likely
- There is a school (Mafuta Combined School), and the presence of other services such as electricity, local authority offices, businesses, local clinic and residential places was sighted.
- The area has good access roads and it can be accessed via the Katima Mulilo – Mafuta back road, 7km southeast of central Katima Mulilo.
- The site is on school ground premises and the area where the tower will be placed is degraded with few standing mopane trees. The removal of ay trees however will have to be done following careful management measures as documented herein.

The project site is barren with few standing mopane trees. However, the rehabilitation of disturbed areas is important and should be done following the Environmental Management Plan (EMP).

Figure 2: Common vegetation found around the proposed site (Acacia spp.)

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 five telecommunication towers in Zambezi (four) and Oshikoto (one) regions and Mafuta Combined School is one of the sites.
Each tower development will include the following:

- The project entails the construction of a 80m Lattice tower with a footprint size of a 14m x 14m;
- Boundary fence to protect the tower from vandalisms and livestock and to limit public access to it;
- The site is to accommodate TN Mobile service and other service providers.

- A locked gate, to control access to the area and the antenna support structure.

Figure 3: Typical telecommunication towers structure and form (visual purposes 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 Mafuta Combined School. 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 this document.

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. • Ensure all reporting and monitoring required under EMP is undertaken, documented, and distributed as needed • Conduct environmental site training (toolbox talks) and inductions with the support of an environmental consultant. • Conducts environmental audit at the work site with the support of an environmental consultant. • Close out all non-conformances. • Ensure materials being used on site are environmentally friendly and safe.
The Directorate of Environmental Affairs	Approve the EMP and any amendments to the EMP. • Approve reports of environmental issues and non-conformances as issued. • Review and approve environmental reports submitted as part of EMP implementation • Ensure that the client is compliant with the EMP through biannual reporting on environmental performance.
Project Manager (Site Engineer)	Control and monitor actions required by the EMP. • Report all environmental issues to HSE Manager. • Ensure documented procedures are followed and records are kept on site. • Ensure any complaints are passed on to the management within 24 hours of receiving the complaint.
Contractor	Follow requirements as directed by the EMP when conducting work. • Report any potential environmental issues to the site engineer/project manager, indicating spilled oil, excess waste, excessive dust generation, dirty water running off the site, and other possible non-conformances

3.4. Planning and design

Table 2: Planning and Design Management Actions

Aspect	Management Requirement	Responsibility	Timeframes
Tower Design	• The design standards to be applied for the Tower should comply with the internationally accepted public exposure guidelines. • The tower design should comply with the aesthetic guidelines for similar structures	Proponent	Pre-construction phase
Labour Recruitment	• 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 Mafuta Combined School.	Proponent	Ongoing
Surrounding property owners	• Consent letters are to be obtained from the property owner before construction.	Proponent	Pre-construction phase
Construction schedule	• 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.	Proponent	Pre-construction
Compensation of land	• 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.	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
Noise pollution	Noise will be generated through: • Construction activities • Moving vehicles.	The health of working personnel could be disturbed. Mafuta Combined School residents could be disturbed by the noise. General annoyance Driving away local animals species near the project site	Environmental	4-6 months	Environmental Control Officer Site Manager	A construction interval will be established, used, and adhered to. Workers will be issued earplugs to protect them from excessive noise. The public will be notified through a printed timetable stating planned operational activities. Construction activities will be conducted during the daytime. Site notices will be erected on, around the site-notifying visitors, and nearby residents of different hazards on site. Areas marked as sensitive environments, especially for birds, need to be avoided during construction and operation.	Construction & Operation
Dust Generation	Dust will accumulate because of the land preparation, onsite movements of vehicles and machines, wind blowing on loose material	This can lead to respiratory illnesses, especially among those working in the area. General air pollution.	Environmental	6-8 months	Environmental Control Officer Site Manager	Dust suppression will be done by watering dust source surfaces. Watering down dusty surfaces,	**Construction & Operation**

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
	during construction, and tipping.	Nuisance to nearby residents The process can also drive away wild animals within the project area's surroundings				Ensure that protective equipment such as respirators are distributed to employees, and ensure their use. Site notices are to be erected on and around the site to inform visitors and surrounding residents to minimize their speed around the site area.	
Soil disturbance	Excavation and land clearing to enable erection of project structures and installation of services	Disturbance to the soil leaving the soil exposed and vulnerable to erosion	Environment	Construction	ECO	Effort should be made to return the topsoil that was stripped from certain site areas All possible trenches excavated for construction on site should be rehabilitated and returned to their pre-excavation state as far as possible. Soils that are not within the intended footprints of the site areas should be left undisturbed and soil conservation implemented as far as possible. 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 a designated hazardous waste bin and transported to the nearest approved landfill site. The	
Loss of Biodiversity	Vegetative plants on site will be removed Habitat destruction for both ground-dwelling species and tree-dwelling species.	The clearing of vegetation will result in the breaking of the ecosystem processes in the area. Loss of aesthetic value of the proposed project area.	Environmental	Construction phase	Environmental Control Officer Site Manager	Little removal of vegetation will be made due to the tower position in the school. Clearly demarcate areas that must not be disturbed, such as wetlands, riparian zones, or areas with high biodiversity.	Construction

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
	-Soil disturbance on and around the site.	The few small animals still habiting the place such as small rodents and birds will be forced away.				Where possible, use already disturbed or cleared land for construction vehicle access routes The ground disturbance will only be limited to the boundary area to avoid affecting a large area. Upon completion of construction activities more regreening of the construction footprint affected area is recommended. A local landscaper can be engaged.	
GhG emissions	Green House Gasses (GHGs) emissions will be produced from the following activities: • Fuels combustion for (construction vehicles and equipment) • Ground excavation releases phosphorus found underground and releases particulate matter into the atmosphere.	Global climate change Air pollution	Environmental	Construction phase	Environmental Control Officer Site Manager Department of Environmental Affairs.	Adopt the use of ethanol-blended fuels wherever necessary. Design an operating system that cuts on fuel consumption. Use of solar energy systems during construction for lighting and other minor energy needs.	Construction & Operation
Waste Generation	Construction and operation are associated with a lot of raw materials and activities that result in pollution	Pollution from oil spills resulting from the handling of various machinery used during the construction phase	Environmental	Construction phase	Environmental Control Officer Site Manager	Ensure that all waste from construction activities is stored and contained in designated containers and transported to an approved waste disposal site.	

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
	The construction and maintenance activities may generate e-waste and this needs to be disposed of sustainably.	Construction rubble, empty packaging containers/bags, and materials remnants. Pollution from sewage				Segregate waste on site Workers should be sensitized to dispose of waste in a responsible manner and not to litter The burriying and burning of waste should be discouraged anywhere on site or close to the site, apart from authorized and approved waste management site Sewage waste should be managed as per the portable chemical toilets' manufacturer's instructions and regularly disposed of at the nearest treatment facility. Bulky waste such as building rubbles must be collected and disposed of for landfilling. Visual inspections and monitoring is advised	
Safety and Health risks	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 and induction on how to effectively use the PPE. Consumtion of alcohol should not be allowed by employees prior to or during working hours Secure vehicles, fuel storage area, equipment to prevent any harm or injuiry to workers and surrounding residents Provide platforms for briefings and meetings about possible safety and health hazards in the workplace	Construction and operation

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
						Provide site signs warning and informing about different hazards on site.	
	Vehicular traffic use	Injuries to workers from movement of heavy trucks during construction	Health and Safety	Construction phase	ECO	Limit the transportation of construction materials, equipment and machinery Heavy truck loads should comply to with the maximum allowed limit while transporting materials and equipment/machinery Drivers of project and construction vehicles should have a valid licence Access roads should be equipped with temporary road signs Vehicles hould not be driven by drivers under the influence Safe loading/offloading areas should be designated.	
	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 stationed on-site always during construction Safety signs during construction and operation should be put on site. No-go areas should be	Construction and Operation

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
						labeled, and PPE specifications should be clear to provide guidance to personnel.	
	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 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). The contractors to be installing the transmission are required to put on appropriate PPE to protect them from possible radiation. 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.	**Operation**
	Avifauna	Bird fatalities	Environmental	Permanent	Environmental Control Officer Site Manager	Towers will be built below 40m in height which will avoid bird fatalities. Construct towers, away from areas of high migratory bird traffic, wetlands, and other known bird areas. Minimize the tower 'footprint' on newly constructed towers.	Operation

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
						If the tower is decommissioned, it should be removed as soon as possible. Use visual daytime markers in areas of high diurnal birds. Security lighting for on-ground facilities should be minimized, point downwards, or be down-shielded. Conduct on-site bird fatalities monitoring on the tower at least every month. The use of white strobes results in less circling behavior by nocturnal migrants and thus less mortality than red pulsating lights. Use insulated conductors and cover energized parts to reduce electrocution risks. **Repair Damage Quickly:** Ensure that markers, lighting, and insulation are maintained and promptly repaired if damaged. **Educate Stakeholders:** Inform contractors, workers, and communities about the importance of bird safety and how they can contribute to preventing fatalities. **Comply with Regulations:** Ensure adherence to national and international environmental laws and regulations aimed at protecting avian species	

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
	Aviation Impacts	Bird fatalities Air transports impacts	Socio-economic Environmental	Permanent	Environmental Control Officer Site Manager	The towers should comply with aviation guidelines so that they do not impact air transport systems. Air traffic visibility systems such as lighting at the tip of the tower. The towers should be designed so that they are visible to birds.	Construction and operation
Land use change	There will be a change in land use and visual aesthetics	Sudden changes in landscape appearances may be unfavorable for Mafuta Combined School residents.	Social Terrestrial environment	Permanent	Environmental Control Officer Site Manager	The development should blend into the existing area through designing and color coding.	Construction and operation
Archaelogy & Heritage	Impact on historical resources	Inadvertent damage or destruction to historical resources	Social	Construction phase	Environmental Control Officer Site Manager	Awaress to contractors on materials / items protected under the National Heritage Act, 2004 Items protected under the definition of heritage found during unearthing for construction works should be reported to the National Heritage Council.	Construction phase
Positive Impacts							
Employment creation	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
Business linkages	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

Impact	Description	Effects	Class	Time frame	Responsibility	Action	Phase
Infrastructure development	The development presents a unique opportunity for infrastructure	Improvement in connectivity. Boost in Local economy	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 networks	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.
- For possible decommissioning purposes, the structure is to be removed when its function ceases and the site should be 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.