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RENEWAL OF ENVIRONMENTAL CLEARENCE CERTIFICATE FOR THE PROPOSED TOWNSHIP ESTABLISHMENT ON PORTION 137 IN RUNDU, KAVANGO EAST REGION NAMIBIA

Updated Environmental Management Plan

Version-FINAL Released:22 August 2025

MEFT APP-6199

DOCUMENT DATA SHEET

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Document type: **Updated Environmental Management Plan**

Document version: **Final for submission**

Application number: **6199**


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ACRONYMS

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
uEMP	Updated Environmental Management Plan
GHGs	Greenhouse Gasses
I&APs	Interested and Affected Parties
MEFT: DEAF	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs and Forestry
NEMA	Namibia Environmental Management Act
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

The **'Consultant'** – this refers to the team that is conducting the ESIA and the preparation of the updated Environmental Management Plan (UEMP) for the development.

The **'Proponent** – this refers to the institutions/departments that are directly involved in the implementation of the project, i.e., Mukatala Building and Construction cc.

The **'Stakeholders'** – this refers to the people, organisations, NGOs that are directly or indirectly affected and interested by the project.

The **'Environment'** – this refers to the ecology, economy, society and politics.

1. CHAPTER ONE: BACKGROUND

1.1. Overview

Mukatala Building and Construction cc, are the prospective owners' portion 137 in Rundu Town, measuring fifteen (15) hectares. In a bid to use the fallow land to its full potential and the benefit of the communities and the country at large Mukatala Building and Construction cc appointed **Enviroplan Environmental Consulting cc** to update their Environmental Management Plan for the said portion 137 of Rundu Townlands No. 1329 a proposed township establishment.

The proposed activity has triggered the application for an environmental clearance certificate as the following listed activity will be triggered by the proposed township development.

LAND USE AND DEVELOPMENT ACTIVITIES

- Section 4. Clearance of vegetation; bush vegetation would be cleared to pave way for installation of municipal service infrastructure.
- 5 5.1 of the regulations states that the change of allow land/open space to any other land use requires an Environmental Clearance certificate.

INFRASTRUCTURE

- Section 10.1 Construction of storm water which forms part of roads constructions form's part land services infrastructure.
- Section 10.1 (a), water reticulation and sewerage pipelines that forms part of municipal services requirements

Section 1 (b), Electricity connection to the development

-10.2 The route determination of roads and design of associated physical infrastructure where;

(a) it is (along/near) a public road; sewer and water reticulation systems

(b) Section 10.2 Construction of internal access roads during servicing of land

ENVIRONMENTAL IMPACTS

-Moderate potential environmental impact.

-Relative or moderate social impact (positive)

Social Impacts

The project is generally expected to improve the socio-economic environment of Rundu town through the provision of affordable residential houses, construction of business and social facilities on the area that has a major boost in business through integrations, employment and tourism on the long term.

1.2. The Environmental Consultant

Mukatala Building and Construction cc assigned EnviroPlan Consulting cc as their appointed Environmental Consultant to conduct develop an updated Environmental Management Plan (uEMP) for the undertaking of aforesaid activities and to apply for a renewal of an Environmental Clearance Certificate with the Directorate of Environmental Affairs.

1.3. Project Location

The portion 137 is situated approximately 6km from Rundu Town along the Rundu-Nkurenkure road opposite Sauyemwa Township. The exact coordinates of the location are:

Table 1: Project site coordinates

A	Lat 17° 55' 35.56"	Long 19° 43' 17.34"
B	Lat 17° 56' 1.25"	Long 19° 43' 5.51"
C	Lat 17° 56' 3.57"	Long 19° 43' 15.82"
D	Lat 17° 55' 47.17"	Long 19° 43' 29.09"

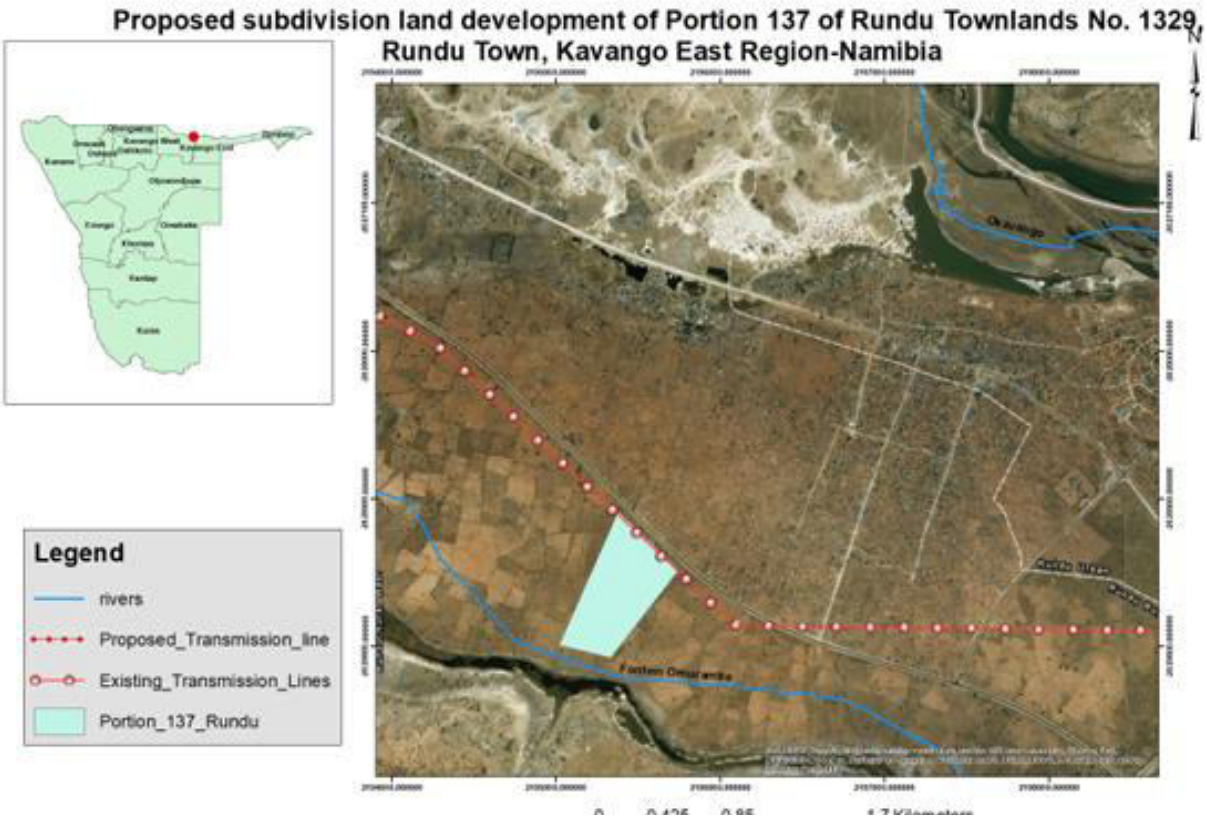

Figure 1: Proposed portion 137: Proposed site Map

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 that concern the proposed activity in order to inform the proponent about the requirements to be fulfilled when undertaking the construction and land servicing activities. This section looks at the legislative framework within which portion 137 will be serviced and operated under. The focus is on the compliance with the legislation during the planning, construction and operational phases. All relevant legislations, policies and international statutes relevant and applicable to the project are highlighted in table 2 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).

2.2. Rationale for amendment of Environmental Clearence Certificate

In 2018 the project proponent conducted an Environmental Impact Assessment (EIA) process for the proposed township establishment on portion 137. It's therefore important to note that. In this respect, this Updated EMP addresses the proposed amendments to the previous ECC and specifically to the Project proponent details.

The proposed activities' construction phase has not taken place yet due to the financial constraints and therefore justifying the renewal of ECC. No physical changes were done on the project area as a result of the proposed activity(s).

2.2.1. Proposed Amendments

The previous ECC was issued to **Mukatara Building and Construction cc** and their address, **P O Box 727 Rundu, Namibia**. The proponent is hereby proposing that the renewal of ECC be issued to a **Mukatala Building and Construction cc and teir respective address as P.O Box 727 Rundu, Namibia**. This will justify the proposed amendments and renewal to the existing ECC considering the company name as registered.

2.2.2. Legal and Other Requirements Compliance

This report presents the EMP and has been undertaken in accordance with the requirements of the Environmental Management Act, No. 7 of 2007 and the Environmental Assessment regulations of 2012. As such, key requirements in accordance to this Act, classifies the proposed project as listed and invokes 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. The most crucial Namibian legislation guiding the proposed activities are presented as table 2 overleaf.

2.2.3. The 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. There is also a need for the proponent to appoint an overall responsible person (Site Manager) to ensure the successful implementation of the EMP.

It solely remains the responsibility of Mukatala Building and Construction cc to ensure;

- That all members of the project team, including contractors, comply with this EMP;
- That all personnel are provided with sufficient training, supervision, and instruction on the EMP; and
- Ensuring that any persons allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood.

Table 2: Policies, legal and administrative regulations

Legislation/Policy/Guiding document	Provision	Project implication
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95(i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish the sustainable objectives which include: Guarding against overutilization of biological natural resources, Limiting over-exploitation of non-renewable resources, Ensuring ecosystem functionality, Maintain biological diversity.	- Through implementation of the proposed environmental management plan the township development on portion 137 will be in conformant to the constitution in terms of environmental management and sustainability.

Legislation/Policy/Guiding document	Provision	Project implication
Vision 2030 and National Development Plans	Namibia's overall Development ambitions are articulated in the Nations Vision 2030. At the operational level, five-yearly national development plans (NDP's) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation.	- The proposed project will increase availability of serviced erven in Rundu as well as creating employment which is in alignment with the NDP and Vision 2030 goals.
Environmental Assessment Policy of Namibia 1994	The Environmental Assessment Policy of Namibia requires that all projects, policies, Programmes, and plans that have detrimental effect on the environment must be accompanied by an EIA study. 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 servicing of the erven and related structures will only commence after being awarded the environmental clearance certificate, thus abiding to the requirements of the Environmental Assessment Policy of Namibia. - The EIA and EMP will cater for the sustainable management of bio-physical environment to mitigate and minimise negative impacts but also embrace positive impacts.

Legislation/Policy/Guiding document	Provision	Project implication
Environmental Management Act No. 07 of 2007	The Act aims at ✓ Promoting the sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment; ✓ To provide for a process of assessment and control of projects which may have significant effects on the environment; ✓ To provide for incidental matters. 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.	- The assessment process and writing of this document was compiled in toto compliance with the EMA Act. Project implementation is in line with the objectives of the EMA of 2007. Guiding procedures were also drawn from the Act to facilitate for the carrying out of the EIA and development of the EMP for the proposed development.

Legislation/Policy/Guiding document	Provision	Project implication
Townships and Division of Land Amendment Act, 1992 (Act 28 of 1992)	"(I) Whenever any area of land constitutes, by reason of its situation, a portion of an approved township, or adjoins an approved township, the Executive Committee may, by proclamation notice in the Gazette and after consultation with the Board, extend the boundaries of that township to include such area". (Minister of Regional and Local Government) A new township needs to be created for approval by the Namibian Planning Advisory Board and the Township Board.	- Through this EIA and the EMP, the project proponent is fulfilling the requirements of the township board and the Ministry of Environment and Tourism.
Public Health Act (No. 36 of 1919)	Under this act, in section 119: "No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	- The project proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected. -Personal protective equipment shall be provided for employees during construction phases. -The development shall follow requirements and specification in relation to water supply and sewerage handling for not to threaten public health of the future residents on this piece of land.

Legislation/Policy/Guiding document	Provision	Project implication
Soil Conservation Act 76 of 1969	The objectives of this Act are to: ✓ Make provisions for the combating and prevention of soil erosion, ✓ Promote the conservation, protection and improvement of the soil, vegetation, sources and resources of the Republic.	- The project will have a localized impact on soil through construction activities and access roads construction hence soil protection measures will be employed and preservation of trees as much as possible. Material removed during road construction must be kept and used for other construction purposes to avoid opening up of more borrow pit.
Nature Conservation Ordinance 1996	To consolidate and amend the laws relating to the conservation of nature; the establishment of game Parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.	The proposed project implementation is not located in any known or demarcated conservation area, national park or unique environments. The project site was selected with this ordinance in mind to ensure that Namibian nature is conserved.
Protected Areas and Wildlife Management Bill	This bill, when it comes into force, will replace the Nature Conservation Ordinance 4 of 1975. The bill recognizes that biological diversity must be maintained, and where 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.	The township development and servicing activities has to ensure that all activities do not fall within the boundaries of any protected area and that the project will not affect heavily endangered vegetation and animals on its site.

Legislation/Policy/Guiding document	Provision	Project implication
Forest Act, 2001 (Act No. 12 of 2001)	The Act gives provision for the protection of various plant species through the Ministry of Agriculture, Water and Forestry (MAWF), Directorate of Forestry).	-Cutting down of significant amount trees or harvesting of plant species should be done upon approval from the Directorate of Forestry. The proponent will also have to ensure that there is no indiscriminate cutting down of trees. -The proposed site is having a small portion that is densely vegetated with savanna bush vegetation and the other bigger portion that is sparely vegetated with few trees on site which are mostly mopane tree species that are not threatened or protected.
National Rangeland Policy and Strategy, 2012	The policy aims at enabling resource users (farmers and managers) to manage their rangeland resources in a sustainable manner and sustainable in that they are economically viable, socially acceptable, environmentally friendly and politically conducive.	-This proposed project will ensure that the local community benefits both economically and socially from the project, this in line with the recently declared poverty eradication Harambee prosperity plan.

Legislation/Policy/Guiding document	Provision	Project implication
National Biodiversity Strategy and Action Plan (NBSAP2)	The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia putting together management of matters to do with ecosystems protection, biosafety, biosystematics protection on both terrestrial and aquatic systems.	-The project proponent has been advised by the EIA Team to recognise the need for ecosystems protection to manage the changing climatic environment and through this project there will be reforestation and fostering of green project which will be promoting the protection and conservation of the biophysical environment, and with this EIA it will be ensure that almost 70% of grown tree species on site will not be removed but rather will be part of the development, to promote green development.
National Policy on Climate Change for Namibia, 2010	In harmony with the findings of the IPCC over time and the Earth Summits being held annually the policy seeks to outline a coherent, transparent and inclusive framework on climate risk management in accordance with Namibia's national development agenda, legal framework, and in recognition of environmental constraints and vulnerability. Furthermore, the policy pursues the strengthening of national capacities to reduce climate change risk and build resilience for any climate change shocks.	The proposed project will ensure that there will be limited release of greenhouse gasses such as methane, carbon dioxide, nitrous oxides. Methods such as wet surface operations to reduce dust emissions will be utilised to remove aerosols emitted into the near-surface atmosphere.

Legislation/Policy/Guiding document	Provision	Project implication
Wetland Policy, 2004	The policy provides a platform for the conservation and wise use of wetlands, thus promoting intergenerational equity regarding wetland resource utilization. Furthermore, it facilitates the Nation's efforts to meet its commitments as a signatory to the International Convention on Wetlands (Ramsar) and other Multinational Environmental Agreements (MEA's).	In compliance to this policy the development of site servicing will ensure a standard environmental planning such that it does not affect any wetlands within its locale through recognition of wetlands to promote the conservation and wise utilization of wetlands resources.
Water Resources Management Act, 2013 (Act No. 11 of 2013)	This Act provides for the management, protection, development, use and conservation of water resources and the regulation and monitoring of water services and to provide for incidental matters. (Department of Water Affairs).	Water usage during construction will be supplied by Rundu Town Council.
National Heritage Act 27 of 2004	Heritage resources to be conserved in development. (National Heritage	During the project implementation as soon as objects of cultural and heritage interests are observed such as graves, artefacts and any other object believed to be order than 50 years, all measures will be taken protect these objects until the National Heritage Council of Namibia have been informed, and approval to proceed with the operations granted accordingly by the Council.

Legislation/Policy/Guiding document	Provision	Project implication
National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	"No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: any meteorite or fossil; or 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 any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph (b); or the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or 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.

Legislation/Policy/Guiding document	Provision	Project implication
Pollution Control and Waste Management Bill	This bill has not come into force. Amongst other 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 control air, water and land pollution as agitated by the Act the project proponent will ensure that erven will have approved drainage on site as well as
	to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse." Section 55 "(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment."	standard conservancy tanks that do not threaten public health, adding on an integrated pollution management strategy following the EMP and will be operationalised on site.
Convection on Biological Diversity (CBD)	Namibia is a signatory of the Convention on Biological Diversity and thus is obliged to conserve its biodiversity.	The project will preserve tree species on as part of their plans for green and sustainable development.

The Environmental Management Act 7 of 2007 is the primary custodian of the environment and therefore focuses on the management of environmental resources and accordingly, identifies activities that require authorisation prior to commencement. The proposed facility entails a number of listed activities as listed in Table 3 overleaf.

Table 3: Listed Activities

ACTIVITY	DESCRIPTION OF ACTIVITY	ACTIVITY TRIGGERS
Section 4. Clearance of vegetation	Clearing of bushes to for pave way development	Bushes would be cleared to pave way for installation of municipal service infrastructure.
Section 10.2 Construction of roads	Grading of access road and paths inside	Construction of roads forms part of land services infrastructure.
Section 10.1 storm water	Construction of water reticulation and sewerage pipelines.	Construction of storm water system which forms part of roads constructions form part land services infrastructure.
Section 10.1 (a), water reticulation	Construction of water reticulation and sewerage pipelines.	Construction of water reticulation forms part of municipal services
Section 1 (b), Electricity	Electricity supply to the development.	Installation of electricity system, forms part land services infrastructure.

3. CHAPTER THREE: ENVIRONMENTAL MANAGEMENT PLAN (EMP)

3.1. Introduction

The proposed township development on portion 137 of the Rundu Townlands will have environmental impacts as indicated in the previous chapter. This section is describing the Environmental Management Plan (EMP) for the pre-described impacts associated with the proposed township 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 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 minimise the extent of impact during project life;
- Prevent long term environmental degradation.

3.2. EMP Administration

There is a strong need to clearly outline the roles and responsibilities of all stakeholders to ensure that the smooth and efficient implementation of the EMP. There is also a need for the proponent to appoint an overall responsible person (project manager) to ensure the successful implementation of the EMP as highlighted **in table 4 overleaf**:

Table 4: EMP Implementation

ROLE	ENVIRONMENTAL RESPONSIBILITIES
Mukatala Building and Construction cc	Responsible to enforce EMP implementation of the EMP to contractors and all the day today monitoring
Environmental Control Officer	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 (tool box talks) and inductions with the support of an environmental consultant. • Conducts environmental audit at work site with the support of environmental consultant. • Close out all non-conformances. • Ensure materials being used on site are environmentally friendly and safe.
The Department 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

Environmental Consultant	Conduct and monitor actions required by the EMP where necessary • Conduct environmental site training (tool box talks) and inductions if assistance is required • Conducts environmental audit at work site • Ensure materials being used on site are environmentally friendly and safe.
ROLE	**ENVIRONMENTAL RESPONSIBILITIES**
Site Engineers	Control and monitor actions required by the EMP. Report all environmental issues to HSE Manager. Ensure documented procedures are followed and records kept on site. Ensure any complaints are passed onto the management within 24 hours of receiving the complaint.
Workers	Follow requirements as directed by site engineers. • 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

3.3. EMP Phases

It is very crucial and necessary to clearly address the impacts according to their project phases. This allows timeous preparation and execution of duties.

3.3.1. 6.2.1. Construction phase

The construction phase is the first but shortest phase of this project. However, this the phase concentrated with most severe environmental impacts. It is therefore, important to explicitly articulate impacts involved in this phase. Therefore, it forms the heart of the project implementation since it is involved most dangerous and severe environmental impacts. Mitigation measures to the impacts for this phase are clearly outlined in the following section;

Table 5: Impact and Mitigation measures (Construction Phase)

Impact	Description	Effects	Class	Time frame	Responsibility	Action
Construction Phase-Negative Impacts						
Noise pollution	Noise generation through: -Opening and upgrading of inner roads -Construction of drainage services and water reticulation systems. -Construction of buildings -Moving vehicles.	- The health of working personnel could be disturbed. - Passers-by could be disturbed by the noise. - Nearby residents - General annoyance -Driving away of local animal species near the project site	Environmental	Construction phase	-Environmental Control Officer -Site Manger	- A construction interval will be established, used and adhered to. - Workers will be issued ear plugs to protect them from excessive noise. - Public and nearby residents will be notified through printed timetable stating planned operational activities. - Construction activities will be conducted during daytime with a timetable of noise activities. -Site notices will be erected on and around the site notifying visitors and nearby residents of different hazards on site.

Dust Generation	-Prominent during the servicing of the land -Dust will accumulate because of the land preparation and excavations, onsite movements of vehicles and machines, wind blowing on loose material during construction and tipping. -Dust from the transportation of earth material	- Can lead to respiratory illnesses especially to those working in the area. - General air pollution. -Nuisance to nearby residents	Environmental	Construction phase.	-Environmental Control Officer -Project Manger	- Dust suppression shall be done through watering all potential dust source surfaces. -Ensure that protective equipment such as respirators are distributed to employees exposed to dust surfaces and areas. Ensure they use this equipment.

Impact	Description	Effects	Class	Time frame	Responsibility	Action
Land disturbance (soil)	-Service of the land and other land preparatory activities alter the soil structure, and other ground disturbances (opening of water and sewer reticulation trenches, storm drains-drainage system)	-damage the soil profile, structure -promote soil erosion -affect soil micro and macro-organisms -Excavation and stockpiling of material cause bad scenic view	Environmental	Construction phase	Environmental Manager	-When excavating, the trenches need to be open for the shortest practicable time to minimize potential for the generation of silt laden surface water runoff to the nearby river. Preferably these activities be carried during the dry season were chances of receiving rainfalls are minimum or almost zero. -Excavations pits/trenches for water and sewer system installation must remain open for a very short time before placement -Proposer management of stockpiles to minimize potential for generation of silt laden runoff and the subsequent adverse impact on water quality of the nearby river.

Impact	Description	Effects	Class	Time frame	Responsibility	Action
Loss of Biodiversity	**-**Through removal of plants on site land and other activities. -Habitat destruction ground dwelling species and tree dwelling species. - removal of vegetation on site	-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. -The few small animals still habiting the place such as small rodents and birds will be forced away. -The ecosystem food chain on and around the area will be broken.	Environmental	Construction	Environmental Control Officer -Site Manager	-The proposed project area is relatively disturbed, ¾ of the site has little vegetation cover to be affected by the development because another is is already cleated for mahangu cultivation -All big trees must be preserved and the layout plan must fit into the environment without affecting these trees. - Ground disturbance must only be limited to boundary area to avoid affecting a large area. -Upon completion of construction activities more trees and lawn must be planted on erven and around the township to restore the site into a status that is environmentally friendly (facilitate the implementation of green projects around the township). -When necessary, a permit must be obtained from the Directorate of Forestry before removing endangered tree species if any.

Impact	Description	Effects	Class	Time frame	Responsibility	Action
Greenhouse gas emissions	Green House Gasses (GHGs) emissions will be produced from the following activities: • Fuels combustion for transport (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 -Project Manager	-Adopt the use of ethanol blended fuels wherever necessary.
Pollution from construction activities	-Construction is associated with a lot of raw material and activities that results in general pollution of the land (solid waste), air, nearby river and groundwater. -Excavation and stockpiling of material	-Chemical pollution from oil spills resulting from the handling of various machineries used during the construction phase -Construction rubbles, empty packaging containers/bags and materials remnants. -Construction workers can also pollute the surrounding environs if they are not provided with adequate toilet facilities and a waste management system for domestic waste.	Environmental	Construction Phase	-Environmental Control Officer -Project Manager	-Ensure that all waste from construction activities is stored and contained in designated containers and transported to the Rundu waste disposal site. -Bulky waste such as building rubbles must be collected and disposed at any of the various Rundu municipal satellite sites or for landfilling. -Adequate mobile toilets must be provided at the construction camps for the use of the workers. -A skip container will be put on site and regularly emptied to handle domestic waste. -Earthworks are kept to a minimum to reduce potential for the generation of silt laden surface water runoff -Management of stockpiles to minimize potential for generation of silt laden runoff and the subsequent adverse impact on water quality in nearby river.

Impact	Description	Effects	Class	Time frame	Responsibility	Action
Hydrocarbons release into the environment	There will be no storage of oils and fuel on site, however there is risk of spillage of hydrocarbons from vehicles and machinery operations, maintenance through leakages and spillages which may result in environmental contamination	-Washing away of contaminated soils by rains into nearby river. -Pollution of soil and affecting small living organisms habituating the soil -Result in possible groundwater pollution. -Possible fire risk on and around the site	Environmental	Construction Phase	-Environmental Control Officer -Project Manager	-If many vehicles are working on site at a particular time then implementing a maintenance programme is necessary to ensure all vehicles, machinery and equipment are and remain in proper working order -Vehicle maintenance should be conducted in designated areas only, preferably off-site. -If maintenance is to be conducted on site, these areas should be designed to contain spillages i.e., maintenance site must be bundled and paved and the use of chemicals must be controlled. - Spillages are to be removed from site by a specialist waste removal contractor such a rent a drum. -if any waste oil, fuels and other chemicals from drip trays on stationery vehicles and machinery will be disposed of as hazardous waste at a licensed facility by a specialist hazardous waste handler. -Oil residue will be treated with oil absorbent material such as

Impact	Description	Effects	Class	Time frame	Responsibility	Action
						Drizit or bio-remediation and removed to an approved waste disposal site -Spill kits will be easily accessible and workers will be trained in the use thereof. -Staff and contractors will be trained in the handling and storage of oils, fuels, chemicals and other hazardous substances -No bins containing organic solvents such as paint and thinners shall be cleaned on site, unless containers for liquid waste disposal are provided on site.
Safety and Health risks	-Construction related Safety and Health hazards	**-**Construction activities subject workers to injuries such as occupational dermatitis, slips and fall of humans and objects, musculoskeletal disorders, etc.	Health safety and	Construction Phase	-Environmental Control Officer -Project Manager	-Equip workers with Personal Protective Equipment (PPE), provide trainings on how to effectively use the PPE. -Provide platforms for briefings and meetings about possible safety and health hazards in the work place -Provide site warning signs and informing about different hazards on site. -the Safety officer regularly monitor construction activities and advise workers accordingly

Impact	Description	Effects	Class	Time frame	Responsibility	Action
Population Influx	The project will bring in skilled and unskilled workforce into Rundu area from other places increasing population density in the area.	-There is potential for cultural systems conflict between locals and new people in the area -Potential for rife prostitution and spread of HIV/AIDS and other STDs	Socio Economic	Construction Phase	-Environmental Control Officer -Project Manager	-Train and brief employees to respect local cultures and leaders, -Engage on massive sexual health training and awareness and providing contraceptives such as condoms, as well as provide means counselling for those that are affected by HIV/AIDS and other STDs,
Land use change	-The existing environment will drastically change from a dormant piece of land to a modernised urban development.	-The area will no longer be suitable for agriculture. -Sudden change in landscape appearances may be unfavourable to the conservatives.	-Social -Terrestrial environment	Permanent	-Environmental Control Officer -Project Manger	-The development should blend into the existing area through designing and colour coding. -Green designing will bring life to the site and blend with surrounding areas.
Resources consumption	-The construction industry can be resource intensive, i.e., electrical and water resources.	-The project can result in a strain on available water resources and electricity.	-Socioeconomic	Entire construction phase.	-Environmental Control Officer -Project Manger	-Water saving strategies should be ensured by the site manager and contractors i.e. repairing leakages, opening taps only when water is required and recycling of water on site. -Electricity supply can be augmented by sustainable energy such as solar to power things such as boreholes and smaller appliances on site.

Construction Phase-Positive Impacts						
Impact	**Description**	**Effects**	**Class**	**Time frame**	**Responsibility**	**Action**
Employment creation	-The construction exercise provides an opportunity of outsourcing work	- Improves disposable income to those employed and their immediate families.	Socioeconomic	Project life time	-Project Manger	-Work with local leadership (councillor) on acquiring nonskilled labour from the residents.
Business linkages	-Raw materials acquiring and contracting companies provided 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.	-Socioeconomic	Construction phase	-Project Manger	-The proponent will outsource materials and services from Rundu and Kavango East region at large where possible and this improve the business linkage between the town and other towns or regions.
Infrastructure development	The development presents a unique opportunity for infrastructure development in Rundu.	-Existing roads will be upgraded which will benefit the local community. -Development of the facilities will also pave way for future developers to grow interests in the area and result in ripple effects and quick growing of the area.	-Socioeconomic	Construction phase	-Project manager	-Development such as road upgrading will not only be limited up until the project site, but it will be extended to service other the connecting roads when there is need.

3.3.2. Operational Phase

The operational phase is the most critical component of project implementation since it is the long-term project phase, however, due to the nature of this project, this phase is associated with less impacts as compared to construction phase. This phase will comprise of the actual day to day economic and social activities in the township. This phase is expected to last permanently, but with upgrading activities happening occasionally. There will be several light impacts that will occur on a daily basis or other sequential routine. The phase forms the basis of an Environmental Management Plan that is detailed in Chapter. The major impacts identified by this study for the operational phase are as detailed in the previous chapter.

Table 6: Impact and Mitigation measures (Operation Phase)

Aspect	Description	Effects	Class	Time Frame	Responsibility	Action
Operation Phase-Positive Impacts						
Water usage	-Water is an important resource that will be used by the residents of the township for domestic purposes. The proposed project will be serviced with water by Rundu Town council's water reticulation system.	- A probability of straining local water supply from the municipal council water reticulation system	Environmental	Permanent	Building/Site manager	- Apply a supply and demand model that will be determined by seasonal variations in water availability. -Water saving connections and green plumbing should be in houses -Regular maintenance of water pipes to avoid leakages and wasteful use of water resources.
Energy usage	-Human settlements and business activities consume substantial amount of electrical energy daily, such that energy requirements will need checking.	-Energy supply through the main grid will be strained - Eyesore to the environment	-Socioeconomic	Permanent	-Building/Site manager	-The proponent might use solar energy to power the area in case of a shortage, but initial arrangements is electrical energy shall be supplied by Rundu town council. -Other appliances such as the borehole will use solar energy to minimise energy consumption.

	- Domestic and industrial solid waste will be generated by the residents who will settle in this		Environmental	Permanent	-Site manager	-Visual inspections monitoring
Aspect	**Description**	**Effects**	**Class**	**Time Frame**	**Responsibility**	**Action**
Solid waste	- Domestic and industrial solid waste will be generated by the residents who will settle in this area. It is therefore very important to construct appropriate infrastructure to management thus waste types, etc.	- Eyesore to the Environment -Unwanted nutrient disposal into the soils, - Detrimental to livestock health	Environmental	Permanent	Site Manager	-Visual inspections monitoring -All waste will be managed by Rundu town council, the developer and Rundu municipal will ensure that domestic waste handling facilities such as dust bins and skip containers are available at all erven and public spaces. -Waste separation will be provided to allow recycling of recyclable materials.
Sewerage and effluent waste	Domestic activities will result in ablution sewer water	-Health hazard	-Environmental -Health	Permanent	Site Manager	-All sewerage waste will be channelled into the Municipal sewer reticulation system.
Increased storm water flow	-The area is undeveloped hence most water quickly infiltrates as it reaches the ground, but due to the paving and hard surfaces storm water will increase	-Enhance the chances of flood occurrences -Chances of soil erosion and gully formation will be increased	Environmental	Permanent	-Site Engineer -Environmental Control Officer	-Standard storm water drainage should be part of the water reticulation designs indicating the storm water deposit areas. - All the storm water should be safely discharged off through storm drainage.

Aspect	Description	Effects	Class	Time Frame	Responsibility	Action
Infrastructure hazards	-Infrastructure hazards are potential risks that building pose to its inhabitants, local environment or surrounding residents.	-There is potential for building collapse. -Firebreak potential	-Socioeconomic -Environmental	Permanent	-Site Engineer -Contractor -Project proponent -Building's inspectorate -Ministry of Health and Social Services. -Ministry of Safety and security	-Sewerage infrastructure will be regularly monitored and inspected over time. -Standard buildings will be constructed and building inspection will be done by Town Council officers. -Fire emergency evacuation plan will be put in place to avoid fatalities and injuries in case of an emergency.
Operational Phase-Positive Impacts						
Development of the area	-The project will further develop Rundu the on growing town and regional capital of Kavango.	-Ripple effects will result in construction of supporting infrastructure such as schools, hospitals, car services and supermarkets.	-Economic	Permanent	-Regional council	-The development should be regulated in such a way that the local people are empowered and benefit from the development activities.
Revenue generation	The development is bound to pay tax and rates to Rundu Municipality and the government	-The regional council, communities and other service providers will benefit from revenue generation from the development -Business facilities will be paying tax to the government benefiting the country at large.	National	Permanent	-Project proponent -Inland Revenue department	-The project will benefit the locals, authorities and the government if all dues, rates and taxes are adhered to.

Aspect	Description	Effects	Class	Time Frame	Responsibility	Action
Rehabilitation maintenance of the environment.	Currently the project environment is semi-degraded	-After construction trees will be planted and a green zone created improving the aesthetic value of the environment to a better position than it was before.	Environmental	Permanent	-Building/site manager	-During operation phase tree planting and other green projects will continue for the maintenance of the green zone. -Regular watering of the lawns that will be planted.

3.4. Environmental Monitoring Plan

Monitoring component is very important for identifying successfulness of mitigation measures formulated for the significant impacts identified. The monitoring process identify unforeseen impacts and give enough time to analyse the situation and formulate measures to minimise impact. Survey records and results must be maintained for these monitoring and inspections, highlighting any problems and the measures taken to address it.

Prior to site preparation and construction activities, the main contractor should be present environmental management plan (including, *inter alia*, location of construction camp and toilet facilities, location of material storage areas, solid waste management plan, dust control measures, activity schedule, etc.) for review and approval by the DEA, the environmental monitor and the project manager.

The proponent should present a landscape plan and the trees/vegetation earmarked for protection should be flagged and hoarded by the contractor. The environmental monitoring team of the construction process should prepare an environmental monitoring programme based on the above, the requirements of the EIA, and conditions of the development permit. The major elements of the environmental impact monitoring programme to be implemented during the construction phase of the project are as follows:

- Site clearance to ensure that trees marked for protection if any are left untouched and that large areas of soil are not left exposed and uncovered for extended periods of time.

- Site drainage and surface runoff, especially during and shortly after major rainfall events, to ensure there is no flooding, ponding and runoff of surface water into the nearby river. Compliance of construction works with site management and landscape plans.

- Ensure transportation of earth materials is done by covered trucks and from approved sites.

- The contractor must immediately and completely clean up spills of materials in public areas.

Solid waste disposal practices to ensure appropriate on-site management and final disposal at approved dump.

4. CONCLUSION AND RECOMMENDATIONS

4.1. Conclusion

Based on the assessments and analysis by consultants, the proposed project is going to create permanent land cover/use change on the proposed project site. It is a vast unused land described as the dry shrub savannah environment that is going to be converted into residential, local and general business sites and streets. This report has thus provided adequate mitigation measures for the identified impacts for sustainable land development, but the land development should minimize environmental degradation, thus the EMP provides for the sustainable land development on portion 137.

4.2. Recommendations

To alleviate negative impacts that emanate from the construction and operation phases of the proposed township establishment and its affiliate development, relevant and cost-effective management and mitigation measures will be put in place.

The following recommendations are proposed:
a) Waste Management Recommendations
Solid and liquid waste shall be generated during the project lifespan and must be managed in such a way that it does not impact on the environment.

- The wastewater/sewer reticulation system should be regularly monitored and maintained in good working conditions and odors managed to make the facility environmentally friendly.

- Provision of color-coded dust bins at all erven to ensure that recyclable material is recovered.

b) Environment Management Plan Recommendations

To ensure a healthy and safe environment in the proposed site and its environs, a plan for environmental management has to be instituted through monitoring. This involves the collection and analysis of relevant environmental data of the site including:

- Health & Security provision for workers
- Firefighting equipment that is strategically placed for easy access
- Devoted maintenance status of drainage facilities (drainage lines)
- Energy production and use
- Ensuring that only efficient taps are installed to conserve water.
- Quantification on amount of waste generated and its management to obtain information for continued improvement in handling and disposal
- Observation on socio-economic & demographic characteristics of the projects' life span and identification of unexpected environmental impact
- Formulation of counter-measures to mitigate against the observed unexpected negative impacts and comparing them with actual impacts.

5. REFERENCE

#003/2018 Risk-Based Geotechnical and Environmental Consulting Services cc, ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED TOWNSHIP ESTABLISHMENT ON PORTION 137 IN RUNDU, KAVANGO EAST REGIONNAMIBIA

6. APPENDIX (I): COPY OF PREVIOUS ISSUED ENVIRONMENTAL CLEARENCE CERTIFICATE

7. APPENDIX (II): CV OF LEAD ENVIRONMENTAL ASSESMENT PRACTITIONER