



# 2023

## Environmental Management Plan



Kaisosi River Lodge

ITEMS	INFORMATION DETAILS
Project Title	Environmental Management Plan
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Project Location	Kaisosi River Lodge, Rundu, Kavango East
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Acronyms and definition

Table 1. Acronyms

ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
MEFT	Ministry of Environment Forestry and Tourism
EMP	Environmental Management Plan
EAP	Environmental Assessment Practitioner
WM	With Mitigation
WOM	Without Mitigation

## Definition of Terms

Table 2. Definitions of Terms

Alternatives	Different means of meeting the general purpose and requirements of the activity.
Assessment	The process of identifying, predicting and evaluating the significant effects of activities on the environment, the risks and consequences of activities and their alternatives and options for mitigation with a view to minimise the effects of activities on the environment.
Competent Authority	An organ of state which is responsible, under any law, for granting or refusing an authorisation; or The Minister or any other organ of state may under subsection (1) be identified as the competent authority. EMA (Act 7 of 2007)
Cumulative Impacts	The changes in the environment caused by the combined effects of the projects and other actions, and they should be assessed using methods such as scenarios, thresholds, or models.
Duration	The time during which something continues.
environment	The environment is defined in terms of the National Environmental Management Act, No 107 of 1998, as the surroundings within which humans exist and that are made up of – the land, water and atmosphere of the earth; micro-organisms, plant and animal life; any part or combination of (i) and (ii) and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being
Environmental Assessment Practitioner	A person designated by a proponent to manage the assessment process
Environmental Impact Assessment	A process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.
Environmental Management Plan	The EMP is a detailed plan for the implementation of the mitigation measures to minimise negative environmental impacts during the life-cycle of a project. The MP contributes to the preparation of the contract documentation by developing clauses to which the contractor must adhere for the protection of the environment. The EMP specifies how the construction of the project is to be carried out and includes the actions required for the Post-Construction Phase to ensure that all the environmental impacts are managed for the duration of the project’s life-cycle. Therefore the EMP will be a working document, which will be reviewed when necessary, or if required by the authorities.

Extent/Scale	The physical extent of the impact
Intensity	The quality or state of being intense, the magnitude of a quantity
Mitigate	Make (something bad) less severe, serious, or painful.
Nature of Impact	A brief description of the type of impact the proposed development will have on the affected environment
Probability	The likelihood of the impacts actually occurring
Proponent	Is the project applicant (i.e. the developer) is responsible for complying with the requirements of the EIA and for all associated costs incurred when following the EIA process, is responsible to appoint an independent consultant who will act on the proponent's behalf in the EIA process
Operational Phase	The period following the Construction Phase, during which the proposed development will be operational.
Rehabilitation	Rehabilitation is defined as the return of a disturbed area to a state which approximates the state (where possible) which it was before disruption. Rehabilitation for the purposes of this specification is aimed at post-reinstatement re-vegetation of a disturbed area and the insurance of a stable land surface. Re-vegetation should aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.

## 1. Background Information

### 1.1. Introduction

Conserver Investment CC (The Consultant) was requested by the proponent (Kaisosi River Lodge) to update their existing environmental management plan (EMP) for the lodge, situated in Rundu, Kavango East. According to the available documents, the Environmental Clearance for Environmental Management Plan for Kaisosi River Lodge of the EEC was Issued in 2015, thus the EMP for the redevelopment. In order to comply with Namibian legislation, codes and standards, the Proponent wishes to apply for renewal of the Environmental Clearance Certificate (ECC) for the lodge operations. In support of the ECC renewal application, the EMP will be submitted to the Ministry of Environment, Forestry and Tourism (MEFT).

Environmental Management Plan (EMP) is a guidance document to measure and achieve compliance with the environmental protection and mitigation requirements of a project, which are typically requirements for project permits/approvals. An EMP is an essential product of an Environmental Assessment (EA) process. This EMP has been drafted in accordance with the Namibian Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (2012). Section 44 of that Act, I list in the Annexure to the Schedule, activities that may not be undertaken without an environmental clearance certificate of which Kaisosi River Lodge forms part of. Prior to the drafting of the EMP, A baseline environmental assessment for the lodge was conducted in order to establish a clear understanding of the existing environmental conditions in the project area and to identify the potential impacts of the project current operations.

The development comprises of a lodge building cluster, consisting of a lodge centre admin offices, self-catering guest rooms, guest rooms, guard rooms, nature pool, boat, campsites and a water park. The lodge cluster was designed to fit into the surrounding bush environment, with minimal impacts on surrounding flora and fauna. As part of this legal permit process an EMP has been drafted as part of the Environmental Impact Assessment process. The Environmental Management Plan EMP serves as a legal document that must be complied with and strictly enforced by the proponent, contractor and any other party associated with the Lodge.

### 1.2. Project Standards

#### 1.2.1. Regulations

Environmental legislation in Namibia was promulgated because environmental degradation must at the very least be minimised and at the most prevented.

Table 3: Regulations

The Constitution	Promote the welfare of people Incorporates a high level of environmental protection. Incorporates international agreements as part of Namibian law.
Environmental Management Act (Act No. 7 of 2007)	Defines the environment and Promote sustainable management of the environment and the use of natural resources, provide a process of assessment and control of activities with possible significant effects on the environment
Environmental Management Act Regulations Government Notice No. 28-30 of 2012	Commencement of the Environmental Management Act, Lists activities that require an environmental clearance certificate and provide Environmental Impact Assessment Regulations.
Namibia Tourism Board Act no. 21 of 2000, Government Notice 261 of 2000	Provide for the registration and grading of accommodation establishments, provide for the declaration of any sector of the tourism industry as a regulated sector and for the registration of businesses falling within a regulated sector, provides regulations and minimum requirements pertaining to Levies payable, registrations of regulated businesses and registrations of accommodation establishments
The Water Act (Act No. 54 of 1956)	Remains in force until the new Water Resources Management Act comes into force, defines the interests of the state in protecting water resources. Controls the disposal of effluent.
Water Resources Management Act (Act No. 11 of 2013)	Provide for management, protection, development, use and conservation of water resources, prevention of water pollution and assignment of liability.
Public and Environmental Health Act (Act No. 1 of 2015) Government Notice No. 86 of 2015	Provides a framework for a structured more uniform public and environmental health system, and for incidental matters. Deals with Integrated Waste Management including waste collection disposal and recycling; waste generation and storage; and sanitation.
Forest Regulations: Forest Act, 2001	Makes provision for the protection of the environment and the control and management of forest fires. Provides the licencing and permit conditions for the removal of woody and other vegetation as well as the disturbance and removal of soil from forested areas
Forest Regulation Act of 2001	Declares protected trees or plants, issuing of permits to remove protected tree and plant species
Labour Act No 11 2007	Provides for Labour Law and the protection and safety of employees. Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997



Atmospheric Pollution Prevention Ordinance No. 11 of 1976	Governs the control of noxious or offensive gases , prohibits scheduled process without a registration certificate in a controlled area, requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process.
Hazardous Substances Ordinance No. 14 of 1974	Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export. Aims to prevent hazardous substances from causing injury, ill-health or the death of human being
Charter of the Regional Tourism Organisation of Southern Africa (RETOSA), 1997	Development of tourism through effective marketing of the Region in collaboration with the public and private sector. Facilitate, encourage and assist in the development of legal and ethical tourism throughout the Southern African Region taking due consideration of the overall development of the people, the Region and the Region's natural and cultural resources

### 1.3. Purpose of the EMP

The EMP contains the necessary mitigation and recommended actions as well as the timeframe and person responsible for the actions. The ultimate responsibility of the implementation of the EMP rests on the Proponent, Kaisosi River Lodge. The EMP is a legally binding document that is an important part of the Environmental Assessment process and needs to be strictly adhered to. Workers and contractors must be made aware of the EMP, their responsibilities.

#### 1.3.1. Objectives of EMP

This EMP has the following objectives:

- To outline functions and responsibilities of the responsible persons involved in the construction and operation of Kaisosi-Lodge
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels.
- To establish a method of monitoring and auditing environmental management practices during operation and decommissioning phases of development.
- Specify time periods within which the measures contemplated in the environmental management plan must be implemented, where appropriate
- To outline mitigation measures and environmental specifications which must be implemented to ensure environmental and social protection of the surrounding environment; and
- To prevent long-term or permanent environmental degradation.

#### 1.3.2. Structure of EMP

The EMP is separated into two (2) phases. Each phase has specific issues unique to that phase. The impacts are identified and given a brief description. The two (2) phases of the Development are identified as below:

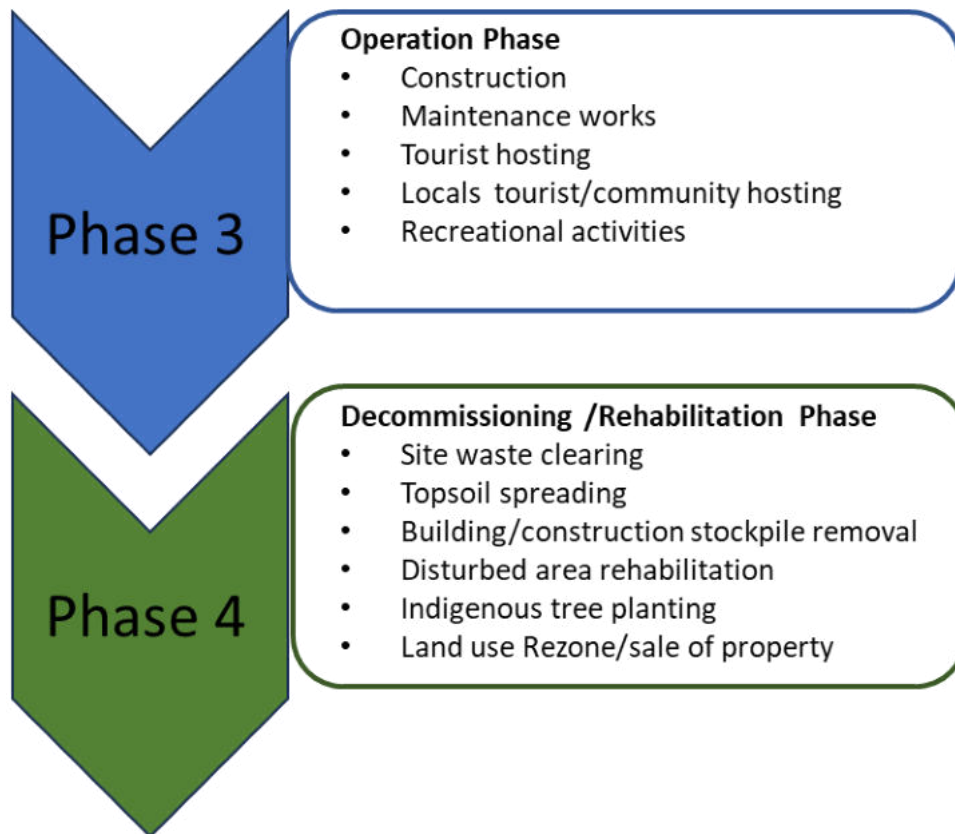


Figure 1. EMP Phases

After analysing the criteria such as extent, duration, intensity, etc. under each phase, a discussion is presented where appropriate. The Environmental Management Plan is then shown and the Mitigation measures in each development phase identified.

### 1.3.3. Roles and Responsibilities

#### **Lodge Owner/Operator**

The proponent (Kaisosi River Lodge) is ultimately accountable for ensuring compliance with the EMP and the conditions contained in the Environmental Clearance Certificate (ECC). The ECO must be contracted by the applicant as an independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of ECC and the EMP for the project. The applicant is further responsible for providing and giving a mandate to enable the ECO to perform his/her responsibilities. The applicant must ensure that the ECO is integrated as part of the project team to monitor the condition of the ECC.

## **Lodge Manager**

The Lodge Manager has over-all responsibility for managing the project, contractors, and consultants and for ensuring that the environmental management requirements are met. All decisions regarding environmental procedures must be approved by the Lodge Manager. The Lodge manager has the authority to stop any operational activity in contravention of the EMP.

## **ECO**

An independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of EA, and the EMP for the project. The ECO must be on site prior to any site establishment and must endeavour to form an integral part of the project team.

### **1.3.4. Awareness and Training**

- Environmental awareness training must take place throughout the operational phase of the lodge. The Lodge Manger is to conduct monthly environmental awareness briefings, in consultation with the ECO.
- Workers to be informed strictly abide by the EMP, Health and Safety Regulations, as well as conditions of the Environmental Clearance Certificate, if granted by the Competent Authority.
- An environmental awareness plan must be implemented for both the operational and decommissioning phases.
- The approved EMP will provide the basis of the information to be supplied, as well as any other relevant documentation, including any specialist reports. All impacts that could potentially arise and affect the environment will be discussed and explained in detail, as well as required mitigation measures.
- It is important to ensure that all personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimization of environmental harm.
- Basic training in the identification of protected, rare and endangered flora and fauna that may be encountered on the site. Records must be kept of those that have completed the relevant training. Training must include the environment, health and safety as well as basic HIV/AIDS education.

## **2. Project Location and Description**

### **2.1. Location and Project Details**

Kaisosi River Lodge is situated 7 km East of Rundu, in the North East of Namibia on the banks of the perennial Kavango River, en route to Divundu and Kalima Mulilo. The plot where the lodge is located is 37 hectares in size. This peaceful oasis, which can be reached in a normal sedan vehicle, is an ideal place for nature lovers and bird watchers.



Figure 2. Kaisosi River Lodge Map



Figure 3 . Kaisosi River Lodge Erven Layout

## 2.2. Description of the Environment

### 2.2.1. Climate

Kaisosi River Lodge shares a hot semi-arid climate, with hot summers and relatively mild winters (with warm days and chilly to cool nights). Even though it has a hot semi-arid climate, the area experiences high diurnal temperature variation during the winter with average high temperatures at roughly 26 °C and average low temperatures at 6 °C. This large swing in daily temperature is more common place among areas with cold semi-arid climates. During the summer, the diurnal temperature variation is less pronounced. The average annual precipitation is 568 mm although in the 2010/2011 rainy season 757 millimetres were measured.

### 2.2.2. Topography

The region is topographically fairly flat with elevations ranging from 1000 to 1200 . The topography descends northwards towards the Okavango River and eastwards towards Botswana (Makgaikgadi Depression). On this general flat topography subtle changes occur due to longitudinal dunes and associated inter dunal depressions and “dry-fossil” river valleys known locally as the “omirambas”

### 2.2.3. Geo and Hydrogeology

The area consists of completely weathering reddish sandy soils. The area is dominated by sand substrate upon observation during the baseline assessment conducted. The area is underlain by the Kalahari and Namib sands, which are dominated by cambic arenosols, albic arenosols and calcic xerosols (Mendelsohn & el Obeid, 2003). two aquifer types are present in the Kavango region. Firstly the primary porosity aquifers present in the Kalahari Group sediments, which occur throughout the region. Secondly, the secondary permeability aquifers (fractures/faults) of the Damaran meta-sediments and the Karoo basalts. The Kalahari Group sediments constitute the most important aquifers being utilized for bulk water supply, in particular paleo-channels of the Okavango River and rural settlements.

### 2.2.4. Flora and Fauna

The region has a high occurrence of reptiles, snakes. This includes cobras, puff adders (inhabit grasslands and bush ecosystems) and the black and green mamba (inhabiting the riverine ecosystems). The region generally is a habitat of a wide number of lizard species and tortoises. However, on the baseline study conducted on site, only the monitor lizard was spotted the other reptiles and snakes are prevalent on site, but could not be spotted.

The Kaisosi River Lodge falls within the Broadleaved Tree-and-Shrub Savanna Biome. Situated east of Rundu town and close to the Kavango River ,the area has to some extent a densely vegetated areas composed of floodplain grasslands and lush woodlands. Broadly speaking, relatively larger deep-rooted trees such as teak and mangetti dominate on deep sands, while shallower soils in valleys support shrubs and grasses of various species. The larger trees such as kiasat (*Pterocarpus angolensis*), teak (*Baikaea plurijuga*), silver terminalia (*Terminalia sericea*) and red seringa (*Burkea Africana*) .The banks of the Kavango River originally supported forests with distinctive trees such as knobthorn (*Acacia nigrescens*), weeping wattle (*Peltophorum africanum*) and jackalberry (*Diospyros mespiliformis*), and a dense shrubby undergrowth.

### 2.2.5. Demographic and economic characteristics

According to the 2011 National Census, Rundu had the second highest population (63,431) among all towns in the country following Windhoek with a population of 325 858. The town was founded in 1936 by the South African colonial government and have always served as an administrative centre for the Kavango region. The last labour force survey of 2016 estimated the unemployment rate in Kavango East region at 40 percent above the 33 per cent national unemployment rate. population is estimated at 63,431 residents excluding those living in nearby villages that are not part of the jurisdiction of the town, with an annual population growth of 5.4 percent (2011 National Census).

## 2.3. Project Phases

### 2.3.1. Operational Phase

It is envisioned the Lodge usually hosts groups of tourist that visit the lodge around winter. It is envisioned that groups will be hosted per month and of this group they are a few locals that usually make use of the facility. During operation the staff are accommodated at the staff quarters. Furthermore, to limit disturbance on the surrounding environment, noise levels must be kept to a minimum. Any construction activities within the facility will be done in such a way as to minimise the impacts on the environment. Waste management is and will be conducted by a service provider outside the lodge whenever required in order to minimise the waste produced. No waste disposal on site. Swimming makes use of natural water without chlorine due to the close proximity of the river and also to safe guard riverine ecosystem.

### 2.3.2. Decommission and Rehabilitation Phase

Rehabilitation should be seen as an on-going process during the operational phase of the establishment. Rehabilitation should include the following:

- The site must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.
- Excess topsoil is to be spread evenly over the area in a manner that blends in with the natural topography.
- Excess stockpiled building material generated during the operational phase of the lodge to be removed completely and the areas levelled
- Disturbed sites and obsolete roads should be rehabilitated by breaking the surface crust and erecting earth embankments to prevent erosion, while vegetation should be re-established.

- Ensure that the construction site is rehabilitated using appropriate indigenous vegetation. Salvaged vegetation, rather than new planting or seeding, should be used to the extent possible.
- Should the Lodge shut down, an appropriate closure and rehabilitation must be implemented. It is the responsibility of the proponent to ensure adequate funds are available for rehabilitation should closure take place.
- Should the facility be sold competent authority should be notified and all management reports, regulatory requirement be handed over to the new owner.
- In case the facility change land use or rezone, environmental requirement should be communicated to the local authority, tourism board and or competent authority.

#### 2.4. Health Safety and Environment

The Proponent must adhere to the Labour Act No 11 2007 and Public and Environmental Health Act (Act No. 1 of 2015) provision. This includes, but is not limited to the following:

- Workers must be provided with dust masks when working in conditions that require personal protective equipment
- Operators of equipment and vehicles must be licenced and trained
- Vehicles must be properly maintained. Hooters and lights must be in working order
- There must be a registered first aider and medical equipment, should the need arise
- Spill kits must be available if the need arises
- Acceptable sanitation must be provided to all workers
- Inspection of the area by health official when necessary
- Report any disease outbreak to the health authority

### 3. Potential Environmental Impacts

#### 3.1. Impact Rating Criteria and Assessment Scale

**Significance = (probability + duration + scale) x intensity**

Probability 1-5  
 Extent 1-5  
 Duration 1-4  
 Intensity 1-10

Table 4. Impact Probability Scale and significance

>75	High Environmental Significance
50-75	Medium Environmental Significance
<50	Low Environmental Significant



### 3.2. Environmental Impact Assessment

Table 5. Impact Assessment

#### A). Soil Quality

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
<b>Loss of Top soil</b>	O	Negative	Site	Long	Medium	Medium	High	<ol style="list-style-type: none"> <li>1. Stockpiled topsoil should be used as the final cover for all disturbed areas where re-vegetation is required</li> <li>2. Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season</li> </ol>	<b>Low</b>
	D	Negative	Site	Long	Medium	Medium	High		<b>Low</b>
<b>Soil Contamination</b>	O	Negative	Local	Short	High	Medium	High	<ol style="list-style-type: none"> <li>1. Should diesel or any other chemical be stored on site, it will need to be stored on a bunded areas and away from any drainage lines.</li> <li>2. Repairs done to construction vehicles should be conducted on concrete surfaces.</li> <li>3. Under no circumstances should oil, diesel or any other chemical be disposed of at the site.</li> <li>4 Mobile toilet facilities should be made available to workers</li> <li>5. A Spill Contingency Plan should be adopted.</li> </ol>	<b>Low</b>
	D	Negative	Local	Short	High	Medium	High		<b>Low</b>
<b>Soil Erosion</b>	O	Negative	Site	Long	High	High	High	<ol style="list-style-type: none"> <li>1. On any areas where the risk of erosion is evident, special measures may be necessary to stabilise these areas and prevent erosion.</li> <li>4. There needs to be minimal vegetation clearance and exposure of soils</li> </ol>	<b>Medium</b>
	D	Negative	Site	Long	High	High	High		<b>Medium</b>
<b>Soil Compaction</b>	O	Negative	Local	Short	Medium	Medium	Medium	<ol style="list-style-type: none"> <li>5. Where roads have become compacted, they shall be ploughed, ripped and re-vegetated.</li> </ol>	<b>low</b>
	D	Negative	Local	Short	Medium	Medium	Medium		<b>low</b>

**B). Water Quality**

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Pollution of groundwater/surface water	O	Negative	Local	Long	High	Medium	High	1. Chemical toilets must be provided by the contractor in accordance with Labour Act 2. Machine maintenance of the equipment to be done on an impermeable surface. 3. Watercourses must be avoided during any construction 4. Hazardous substances must be stored away from the buffer area surrounding any water bodies on site to avoid pollution	Low
	D	Negative	Local	Short	Medium	Medium	High		Low
2. Stormwater runoff on site	O	Negative	Site	Medium	Medium	High	Medium	1. Protect area from erosion due to stormwater drainage 2. Collect and use stormwater runoff whenever possible	Low
	D	Negative	Site	Medium	Medium	High	Medium		Low
3. Water quantity	O	Negative	Site	Medium	Medium	High	High	1. Place water saving measures in place 2. Limit the wastage of water	Low
	D	Negative	Site	Medium	Medium	High	High		Medium

C). Air Quality

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Air pollution	O	Negative	Site	Short	Short	Medium	Medium	<ol style="list-style-type: none"> <li>Dust suppression techniques should be implemented during dry and windy season</li> <li>Vehicles and equipment must be properly maintained to limit the release of harmful gases</li> <li>Exhaust emission control devices are to be installed on vehicles and/or machinery where practical</li> </ol>	Low
	D	Negative	Site	Short	Short	Medium	Medium		Low

D). Waste Management

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
Waste disposal	O	Negative	Local	Local	Medium	Medium	Medium	<ol style="list-style-type: none"> <li>Ensure sustainable waste management practises are in place</li> <li>Implement recycling</li> <li>Bins must be provided on site and coded</li> <li>Littering by the workers shall not be allowed</li> <li>Sewage may not be disposed of in the River</li> </ol>	Low
	D	Negative	Local	Local	Medium	Medium	Medium		Low

E) Flora and Fauna

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
Impact on faunal activity	O	Negative	Local	Short	Medium	Medium	High	<ol style="list-style-type: none"> <li>No snaring, hunting, trapping, fishing or killing of any animal on the lodge site.</li> <li>Any malicious damage to any fauna species present on site will be considered a punishable offence, and the appropriate measures will be followed.</li> <li>Limit the clearing of vegetation, removal of logs, rocks</li> <li></li> </ol>	Medium
	D	Negative	Local	Short	Medium	Medium	High		Medium

Impact on vegetation	O	Negative	Site	Short	Medium	Medium	High	<ol style="list-style-type: none"> <li>1. Limit the removal of vegetation.</li> <li>2. Restrict movements to designated paths only</li> <li>3. Prevent illegal removal of protected plants species</li> <li>4. Minimise disturbance and loss of topsoil.</li> <li>5. Keep surrounding vegetation, especially larger trees and shrubs, to create a screen that reduces flood impacts.</li> <li>6. Remove Invasive alien species on site</li> </ol>	Medium
	D	Negative	Site	Short	Medium	Medium	High		Medium

#### F. Noise

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
1. Noise	O	Negative	Site	Medium	Medium	High	High	<ol style="list-style-type: none"> <li>1. Noise levels must be kept within acceptable limits</li> <li>2. During operation the Lodge must implement noise control measures such as no loud music or other noise disturbance</li> </ol>	Low
	D	Negative	Site	Medium	Medium	High	High		Low

#### G. Light

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
Light pollution	O	Negative	Site	Short	Minor	High	Medium	<ol style="list-style-type: none"> <li>1. Operational hours will be restricted today operations where visible</li> <li>2. Implement light suppression techniques during operational phases (Yellow lights)</li> </ol>	Low
	D	Negative	Site	Short	Minor	High	Medium		Low

#### H. Visual

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	WM
Visual Impact	O	Negative	Site	Short	Minor	High	Medium	1. The site must be kept neat and tidy at all times 2. Sustainable practices must be used to guide the design of buildings 3. After construction rehabilitation of the site must occur. 4. No overcrowding 5. Renovation of dilapidated structure	Low
	D	Negative	Site	Short	Minor	High	Medium		Low

I. Social

Nature	Phase	Type	Extent	Duration	Intensity	Probability	WOM	Mitigation	
2. Social	C	Positive	Regional	Long	Long	Long	None	None	
	O	Positive	Regional	Long	Long	Long			

3.3. Environmental Management Plan

Table 6. Management Plan

ENVIRONMENTAL MANAGEMENT PLAN			
Objective	Action/Description	Timeframe	Responsibility
Minimize the potential for ground and surface water pollution	A minimum buffer zone of 30 m around all watercourses should be established and regarded as No-Go areas for the development. The only exception shall be the access road.	Continuous	Lodge Manager/Owner
	Construction within or near drainage lines should take place outside of the rainy season when the flow of the rivers is at a minimum	Continuous	Lodge Manager/Owner
	Buildings and other hardened surface infrastructure (including storm water attenuation measures) should be located outside of buffered watercourses, sensitive areas and riparian habitat	Continuous	Lodge Manager/Owner
	Servicing and maintenance of vehicles as far as possible must occur outside of the boundaries Lodge. If maintenance does occur on site due to breakdown, all steps must be undertaken to avoid hydrocarbon spills/leakages.	Continuous	Lodge Manager/Owner
	Minimize petrol, diesel, and oil leaks by allocating a loading zone, which is protected against such leaks. Drip trays must be secured and emptied regularly.	Continuous	Lodge Manager/Owner
	Should diesel or any harmful chemical be stored on site, it will need to be stored on a hard surface and 100m from the drainage lines	Continuous	Lodge Manager/Owner
	Spilled hydrocarbon or any harmful chemical must be treated as a hazardous waste and needs to be disposed of as it occurs in appropriate hazardous waste containers and removed off site as soon as possible.	Continuous	Eco-Lodge Manager & Environmental Control Officer
	No washing of equipment or machinery may occur in the watercourse	Continuous	Lodge Manager/Owner
	Bio-remediation of soils must take place after any accidental spills	Immediate	Lodge Manager/Owner
	Water quality monitoring of the river and storm water course should be implemented	Quartely	NamWater/Lodge Owner
	Specify water saving devices and technologies wherever possible. Measures include the specification of low flow shower heads and taps, and the use of grey water for on potable activities such as road wetting and irrigation	Continuous	Lodge Manager/Owner

Minimize the wastage of water	Avoid manicured landscape/gardens	Continuous	Lodge Manager/Owner
	Ensure that consumption does not exceed permitted quantities. Take action to reduce consumption if necessary.	Continuous	Lodge Manager/Owner
	Ensure that all construction personnel are trained in water wise principles, and that they practice prudent use of water during the operational phase.	Continuous	Lodge Manager/Owner
Conservation of topsoil and stockpiling and Erosion prevention	Conserve topsoil through stripping and stockpiling prior to the commencement of works in any area, pending reapplication during rehabilitation.	Continuous	Lodge Manager /Environmental Control Officer
	Topsoil stripped from the operation footprint must not be spoiled but stockpiled and preserved for use in rehabilitation.	Continuous	Lodge Manager/Owner
	All stockpiles and spoil material should be located on even surfaces and more than 100m from watercourses so as not to cause sediment to wash into the system	Continuous	Lodge Manager/Owner
	All stockpiles should be protected from windy conditions or heavy rain. This includes clothor vegetation	Continuous	Lodge Manager/Owner
	All stockpiles must be kept neat and tidy and free of weeds	Continuous	Lodge Manager/Owner
	Where roads have become compacted, they shall be ploughed, ripped and re-vegetated.	Continuous	Lodge Manager/Owner
	On any areas where the risk of erosion is evident, special measures need to be implemented to prevent erosion. These may include, but not restricted to: <ul style="list-style-type: none"> <li>• Using mechanical cover or packing structures such as geofabric to stabilise steep slopes or hessian, gabions and mattress and retaining walls</li> <li>• Straw stabilising</li> <li>• Brushcut packing Mulch or chip cover</li> <li>• Hydroseeding</li> <li>• Sprigging or sodding</li> <li>• Constructing anti-erosion berms</li> <li>• Erection of barriers</li> <li>• Erection of shade nets etc. These erosion control measures must be regularly maintained.</li> </ul>	Continuous	Lodge Manager/Owner
Where erosion does occur on any completed work/working areas, these areas shall bereinstated to previous condition.	Continuous	Lodge Manager/Owner	
Soil Pollution	Soil that has been polluted must be removed from site and disposed of at a relevant landfillsite	Continuous	Lodge Manager/Owner

	If soil pollution/contamination does occur, the site must be immediately rehabilitated	Rehabilitation	Lodge Manager & Environmental Control Officer
Limit the disturbance and destruction of vegetation, fauna and habitat	Plan to leave as much of the natural vegetation intact as possible.	Once Off	Lodge Manager & Environmental Control Officer
	Vegetation disturbance and removal must be kept to a minimum and the areas monitored to ensure that areas are exposed for brief periods of time only	Continuous	Lodge Manager/Owner
	Construction activities must be carefully planned and implemented in such a way that facilitates and aids in the rehabilitation and establishment of plant communities	Continuous	Lodge Manager/Owner
	Vegetation removal must be phased in order to reduce impact of construction	Continuous	Lodge Manager/Owner
	Progressively rehabilitate (rip, scarify and plant) areas as soon as works have been completed	Continuous	Lodge Manager/Owner
	Consider the selective trimming of branches before opting to remove any trees	Continuous	Lodge Manager/Owner
	Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. No vegetation outside of the demarcated construction areas may be removed whatsoever	Continuous	Lodge Manager/Owner
	There shall be no unauthorised entry, litter, stockpiling, dumping or storage of equipment or materials	Continuous	Environmental Control Officer
	Keep surrounding vegetation, especially larger trees and shrubs, to create a screen that reduces flood impacts	Continuous	Lodge Manager/Owner
	Protected trees must be marked, their location recorded and must be avoided as best as possible. If any protected species cannot be avoided a permit must be applied for from MEFT Forestry Department.	Once Off	Environmental Control Officer
Protection of Fauna	All effort must be made to minimise the disturbance of wild animals on and within the close vicinity of the Lodge site	Continuous	Lodge Manager/Owner



	No trapping, snaring, hunting, fishing or killing of any animal may occur on the Eco-Lodgepermit site.	Continuous	Lodge Manager/Owner
	Ensure that construction employees are briefed on the potential occurrence of protected faunal species, what they look like, and where they are likely to be found. Employees are to be instructed that these species are not to be hurt or destroyed if encountered. This applies specifically to the snakes, lizards and spiders, as these are often perceived to be vermin and pests	Continuous	Lodge Manager/Owner
	Develop a procedure for dealing with animals encountered on the site, including dangerous animals and vermin. Where necessary, call in professionals to remove the animals. Personnel are to be instructed on the presence of dangerous game and the appropriate behaviour and safety upon encountering such game	Continuous	Lodge Manager/Owner
	Where possible, large/canopy trees should be retained (pertaining to all development areas) since they provide critical important breeding habitat for bird species;	Continuous	Lodge Manager/Owner
	Disturbed areas will be rehabilitated and vegetation planted to resemble the area prior to Lodge, both in terms of vegetation cover and habitat	Rehabilitation Phase	Lodge Manager & Environmental Control Officer

	Design all perimeter fences so as to avoid corners where predators can chase and trapgame	Continuous	Lodge Manager/Owner
	Any alien plants which appear or begin to establish must be removed	Rehabilitation Phase	Lodge Manager/Owner
Vehicle access	The main access road to the permit area must be established before operation commences	Continuous	Lodge Manager/Owner
	Determination of the construction vehicle/truck routes and times of operation/delivery must be carefully planned	Continuous	Lodge Manager/Owner
	Vehicle access must be strictly contained onsite. Vehicles may only use designated roads and access points as determined by the Lodge Manager during operationscommence	Continuous	Lodge Manager/Owner
	Access road and loading area will be properly maintained, and this includes appropriate storm water management and dust control (i.e. wetting)	Continuous	Lodge Manager/Owner
Chemicals	Provide the ECO with a list of all petroleum, chemical, harmful and hazardous substancesand materials on site, together with storage, handling and disposal procedures for these materials.	Continuous	Lodge Manager/Owner
	Ensure that all hazardous substances (chemicals, oils, etc.) are stored in appropriate,tamper proof containers in locked stores.	Continuous	Lodge Manager/Owner
	No smoking is allowed inside the stores or within 3m of a bund.	Continuous	Lodge Manager/Owner
	The proponent must ensure that there is adequate fire-fighting equipment at the fuel stores	Continuous	Lodge Manager/Owner
	Fuels and chemicals may not be stored under trees	Continuous	Lodge Manager/Owner
	After construction has been completed excess material and chemicals must be removed.	Rehabilitation Phase	Lodge Manager/Owner
Construction	Ensure that concrete and cement works are undertaken in specified areas only	Continuous	Lodge Manager/Owner

	Ensure that all operations that involve the use of cement and concrete are carefully controlled. Water and slurry from concrete mixing operations must be contained to prevent pollution of the ground surrounding the mixing points.	Continuous	Lodge Manager/Owner
	Use plastic trays or liners when mixing cement and concrete: Do not mix cement and concrete directly on the ground	Continuous	Lodge Manager/Owner
	Excess concrete from mixing must be deposited in a designated area awaiting removal to an approved landfill site	Continuous	Lodge Manager/Owner
	All visible remains of excess concrete shall be physically removed immediately and disposed of as waste. Washing the visible signs into the ground is not acceptable. All excess aggregate shall also be removed.	Continuous	Lodge Manager/Owner
	Once construction ceases there must be a removal of all toilets, bins, machinery and other equipment on site. Site must be rehabilitated	Continuous	Lodge Manager/Owner
Waste Management	Waste generated on site must be disposed of in clearly marked bins. These must be emptied daily	Continuous	Lodge Manager/Owner
	Domestic/general waste and hazardous waste must be separated and bins clearly marked.	Continuous	Lodge Manager/Owner
	The use of toilets must be adhered to	Continuous	Lodge Manager/Owner
	If portable toilets are used, they must be regularly emptied.	Continuous	Lodge Manager/Owner
	Temporary drains and berms may be required to capture stormwater	Continuous	Lodge Manager/Owner
	The installation of the stormwater system is of priority and must comply with the stormwater management plan	Continuous	Lodge Manager/Owner
	No disposal of raw sewage should occur on or near the site. If disposal of sewerage occurs near site Sand filtration process to be applied.	Continuous	Lodge Manager/Owner
Minimise atmospheric emissions and dust generation	Wetting of construction area or road must occur during very dry or windy conditions or if dust becomes a major problem	On windy days	Lodge Manager/Owner
	Rehabilitation will ensure good vegetative cover which will reduce dust creation.	Rehabilitation Phase	Lodge Manager/Owner

	Dust fallout monitoring will be introduced if dust becomes an on-going problem.	Monthly	Lodge Manager/Owner
Control noise	Operational hours during the construction phase will be restricted to day. No noise producing activities may take place outside of days hours	Continuous	Lodge Manager/Owner
	Noise from workers during the construction phase must be controlled.	Continuous	Lodge Manager/Owner
	Where possible noise suppression and silencers must be applied to all construction equipment and vehicles. Construction equipment and vehicles must be maintained.	Continuous	Lodge Manager/Owner
	Hearing protection will be provided for employees operating heavy or noisy machinery.	Continuous	Lodge Manager/Owner
	Noise level monitoring will be implemented if necessary.	Monthly	Lodge Manager/Owner
	Once the Lodge is in operation, measures must be implemented to control levels. This includes no playing of loud music.	Continuous	Lodge Manager/Owner
Reduce the visual impact	The Lodge and stockpiling site must be kept neat and tidy at all times	Continuous	Lodge Manager/Owner
	Restrict construction activities if any to daylight hours in order to negate or reduce the visual impacts associated with lighting. No afterhours construction work should be permitted.	Continuous	Lodge Manager/Owner
	Tilt spotlight luminaires to direct the light to the intended spot, instead of allowing it to light areas outside its purpose	Continuous	Lodge Manager/Owner
	A limit to the number of vehicles permitted access to the site per day must be enforced.	Continuous	Lodge Manager/Owner
	Avoid shiny metals in structures. If possible shiny metal structures should be darkened.	Continuous	Lodge Manager/Owner
	Night-time light sources must be directed away from nearby communities and farms	Continuous	Lodge Manager/Owner
	Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of works		Lodge Manager/Owner

Safety	Construction access, should be fenced off to prevent unauthorized access.	Continuous	Lodge Manager/Owner
	Correct signage must be erected at the main access road and entrance to the Lodge areas - includes Lodge authorization, access authorization, warning of Lodge activity, safety warning signs (protective equipment, fire & medical equipment) and contact numbers	Continuous	Lodge Manager/Owner
	Speed limits on access roads and onsite must be set at 40km/hr. This due to wild animals and worker safety	Continuous	Lodge Manager/Owner
	No open fires shall be allowed on site under any circumstances	Continuous	Lodge Manager/Owner
	An armed security must be on site during , to ensure the protection of workers and Property	Continuous	Lodge Manager/Owner

#### 4. Conclusion

Negative impacts associated with the operations and maintenance and during rehabilitation can successfully be mitigated if This EMP is implemented. It is the duty of the lodge manager and owner to ensure to ensure that all regulation relating to the operation of the lodge are followed

#### 5. References

Directorate of Environmental Affairs, 2008. Procedures and Guidelines for Environmental Impact Assessment (EIA) and Environmental Management Plans (EMP), Directorate of Environmental Affairs, Ministry of Environment and Tourism, Windhoek.

Namibia Statistics Agency. Namibia 2011 Population and Housing Census Main Report.

Water Surveys (Botswana) (Pty.) Ltd. 2011. Preliminary Report September 2011: Kavango Region Namibia Regional Monitoring Network Study

#### 6. Appendices

Appendix A. Form 1

Appendix B. ECC Copy