

UPDATED ENVIRONMENTAL MANAGEMENT PLAN (UEMP)

**FOR THE EXISTING AND OPERATIONAL NGUNI HOUSEBOAT (PANGOLIN
VOYAGER HOUSEBOAT) IN KASIKA COMMUNAL AREA OF ZAMBEZI
REGION**



Assessed



Proponent: Nguni Zambezi House Boat cc

Pangolin Voyanger Houseboat

P. O. Box 2333

Ngweze

Namibia

18 May 2022

Title	Environmental Management Plan (EMP) for the existing and operational Nguni Zambezi Houseboat (Measuring 1 hectares)
Environmental Practitioner	Nyepez Consultancy cc
Reviewer	Mr. Kluivert Mwanangombe
Client	Nguni Zambezi Houseboat cc (Pangolin Voyanger)
Status	Final Updated Environmental Management Plan (AEMP)
Issue Date	May, 2022

Definitions and abbreviations

DEA	Directorate of Environmental Affairs
ECC	Environmental Compliance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
I&APS	Interested and affected parties
MAWF	Ministry of Agriculture Water and Forestry
MEFT	Ministry of Environment, Forestry and Tourism

TABLE OF CONTENTS

1. INTRODUCTION.....	5
1.1 PURPOSE THE EMP.....	7
1.1.1 EMP Requirements	7
1.1.2 Compliance to the EMP	8
1.1.3 Proponent responsibility to the EMP.....	8
1.1.4 Possible adjustment to the EMP	9
1.1.5 Legal Framework that area relevant to the EMP.....	9
2. PROJECT DESCRIPTION.....	12
2.1 Project Locality	12
2.2 Houseboat Project Process.....	15
2.3 Employment and Skills Development	16
3. ENVIRONMENTAL MANAGEMENT	16
3.1. Objectives And Targets	16
3.4 Infrastructure.....	17
3.5 Pollution Control & Mitigations.....	17
3.5.1 Handling of Fuel, Oil and Chemicals	17
3.5.2 Sewerage and Greywater.....	18
3.5.3 General Waste	18
3.5.4 Environmental Monitoring.....	19
4. ROLE PLAYERS & RESPONSIBILITIES	19
4.1 Roles and responsibilities	19
4.2 Compliance with Requirements.....	21
4.4 Disciplinary Action.....	21

1. INTRODUCTION

This document presents an amended and updated Environmental Management Plan (EMP) to manage the existing and operational Nguni Zambezi Houseboat, a Houseboat that operates in both the Kasai River channel, Chobe River and Zambezi River channels through Kasika Communal area in the Zambezi Region. The total carrying capacity of the Nguni Houseboat is total of Eight (08) Ten (10) people per day. The lodging and/or docking area of the Houseboat is 1 hectare's size.

The proponent Nguni Zambezi Houseboat acquired an environmental clearance certificate dated 20 November 2018. The expired and existing ECC was based on the same business principle of a houseboat development and operation, the houseboat which usually dock on a 1-hectare portion of communal Riverland. Given the expired dates of the clearance certificate, and in order to ensure compliance to the Environmental Management Act of 2007, the proponent decided to renew the Clearance certificate with no major or notable changes of the business operational model of the Nguni Houseboat cc.

Any minor changes in the operation of the houseboat have and will not change the scope of the physical environment, the physical characteristics of the project area, no change in the extent or size of portion where the first scoping study of houseboat was conducted and the subsequent approval of the environmental clearance certificate. It is therefore required as per the Environmental Act no. 7 of 2007 that an updated Environmental Management Plan detailing such changes in project activities be compiled and submitted to the environmental commissioner for approval.

The proponent, Nguni Zambezi House Boat CC owns and operates the Pangolin Voyager Houseboat the operations on the Chobe River and Kasai Channel in Kasika area of Zambezi Region, Namibia. The project comprises of one houseboat. The houseboat offers recreational and tourism activities on the Chobe River. The houseboat consists of the following:

- Dimensions: 6 m (width) x 20m (length)
- Material: Aluminum, stainless steel, wood
- Energy: Solar powered with a heavy-duty battery in each unit and back-up generator (petrol/diesel), Stove operated with LP gas and Hot water powered by Solar
- Waste management: Fusion Wastewater Treatment Plant, domestic waste bins (separated), and

- Facilities and amenities: Outdoor decks, lounge, kitchen, dining area, sleeping area and bathroom. The boat is able to accommodate 10 guests.

According to the proponent, the existing and operational Nguni Zambezi Houseboat business is serving as a precious, modest mobile hotel to suit the local and international level, which is boosting the local socio-economic, promote and improve surrounding property values and land uses alongside the Kasika area and Chobe riverbanks and has brought competitive employment creation, promote the beautiful scenery, aesthetics of Kasika and Chobbe River. The houseboat is often launched from the existing boat launching area (example through Kasai river stream) as shown in the figure 2.



Figure 1: Description image of Kasika Communal Area & Houseboat River boundaries of operation

According to the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007) (EMA) and the EIA Regulations (GN. No. 30 of 2012), an Environmental Management Plan (EMP) is required to obtain an Environmental Clearance Certificate (ECC) from the Ministry of Environment, Forestry and Tourism (MET) for this business operation to continue.

NYEPEZ Consultants (NC) has been appointed to draft an updated and/or amended EMP as part of the application to acquire a valid ECC. This updated EMP is to be implemented to mitigate the potential impacts of the Houseboat development and business operations. The contents of this updated EMP will be binding on all parties who will have a role to play in the Site operations as stipulated in the report and will be liable for the rehabilitation measures recommended in last section of this report.

1.1 PURPOSE THE EMP

The aim of an updated EMP is to ensure that the activities of this particular existing and operational business development are conducted as per the requirements of the Namibian Environmental Management Act (No. 7 of 2007) and EIA regulations of 2012. The updated EMP provides and explains a clear guideline on how the daily activities should be conducted and also provides a monitoring framework to ensure compliance against the recommended mitigation measures to avert any possible negative impacts.

Furthermore, other purpose of this updated EMP is to provide a management framework for the planning and implementation of the operations of the houseboat and provide standards and operating arrangements so that potential environmental and social impacts of the houseboat are mitigated, prevented and minimized as far as reasonably practicable, and that statutory requirements and other legal obligations are fulfilled. This updated EMP also presents protocols and procedures, and roles and responsibilities to ensure the management arrangements are appropriately and effectively implemented. This EMP is a live document and shall be reviewed at predetermined intervals, and/or updated when the scope of works alters, or when further data / information can be added. All personnel working on the project will be legally required to comply with the standards set out in this EMP.

The 2012 EIA Regulations defines a ‘management plan’ as: “...a plan that describes how activities that may have significant environments effects on the environment are to be mitigated controlled and monitored.”

1.1.1 EMP Requirements

Table 1.1 EMP Requirements as outlined in Section 8 of the EIA Regulations requirement

(j) a draft management plan, which includes –

- (aa) information on any proposed management, mitigation, protection or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation of the environment and closure;
- (bb) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of the activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and
- (cc) a description of the manner in which the applicant intends to modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation remedy the cause of pollution or degradation and migration of pollutants.

1.1.2 Compliance to the EMP

Content of this updated EMP is tailored in accordance with the prevailing EMA Act and the EIA Regulations. The aim is to provide appropriate management measures that would address the identified impacts that the project could bring about as stipulated in the Houseboat development specifications. The remedial and mitigation measures recommended for rehabilitation remain binding to all staffs and all employees. Adherence to the specifications identified herein is highly recommended throughout the lifespan of the facility.

It should be noted that the updated and amended EMP shall not only be limited to the facility operations, but it encompasses the bigger picture. The document serves as the guiding tool to protecting the overall natural, bio-physical and socio-economic environment at large.

1.1.3 Proponent responsibility to the EMP

As the proponent, Nguni Zambezi Houseboat shall assume overall responsibility and implementation of the updated EMP. The Houseboat project Manager holds the mandate and sole responsibility of managing the daily operations and shall ensure that any other person (e.g., Casual Workers) is conversant with the contents of the EMP and adhere to the requirements. The following environmental sensitive conditions as outlined the ECC certificate have been obeyed and complied to;

- That the proponent Nguni Zambezi Houseboat cc have not and does not intend to dispose any waste waters affluents in both the Chobe and Zambezi River channels. The affluent waste

waters are often pumped out at different intervals through a sewerage waste boat (owned by the proponent) that often discharges it to the company’s own-land sewerage plant at Kasika in Namibia. Furthermore, the proponent has mutual and operational agreement with another Namibian owned Houseboat (The Zambezi Queen) for the discharging of Pangolin Voyager houseboat waste water at their inland waste plant, if a dare need of disposal arises.

- That both the Kasika and Impalila Community Conservancy entities are fully involved in the monitoring and overseeing that no Houseboat operating in the Chobe and Zambezi River disposes waste water affluent in the rivers. This empowers the conservancies and community members to give them full responsibility of protecting the river and the environment
- Nguni House Boat has ensured that the most sensitive and key biodiversity habitats along the river and within the rivers and surrounding wetland areas remain protected

A copy of the updated EMP shall be kept at the Site premises and induction sensitization workshops are often conducted with all new employees prior to commencement of their responsibilities.

1.1.4 Possible adjustment to the EMP

The EMP should be considered as an open-ended document that can be updated or amended subject to new information. This EMP represent an amended and updated version of the existing Nguni Zambezi Houseboat operational activities. This allow for adjustments in the document as new information is made available and new mitigation where unforeseen environmental impacts arise.

1.1.5 Legal Framework that area relevant to the EMP

In addition to the EMA and the Environmental Assessment Policy, there exists a host of legal and policy documents and guidelines that govern environmental management as indicated in Table 1 below. Nguni Zambezi Houseboat CC has the responsibility to ensure that NO restricted Houseboat activities will be conducted and will be carried out during any preparation, construction and operation phase of the existing and operational houseboat development.

Table 1: Relevant legislation and the applicability

Legislation considered	Aspect of Project
Regional Councils Act,	The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and

1992 (Act No. 22 of 1992)	coordination of regional policies and development. The main objective of this Act is to initiate, supervise, manage and evaluate development in respective regions. Zambezi Regional Council is an I&AP to this project and they have No objection to the proposed project proposal. Rights shall be reserved to them should they wish to review the EMP.
Water Resources Management Act (Act No. 11 of 2013)	This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Furthermore, any watercourse on/or in proximity to the site and associated ecosystems should be protected in alignment with the listed principles. Construction activities pose danger to surface and underground water resources through the inappropriate use of fuels and lubricants. The proponent shall ensure adequate handling of hazardous substances that could pollute water sources.
Pollution Control and Waste Management Bill (in preparation)	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill will repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) (below) when it comes into force. The Bill also provides for noise, dust or odour control that may be considered a nuisance. The Bill would repeal the Atmospheric Pollution Prevention Ordinance (11 of 1976) (below) when it comes into force. Furthermore, the Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste management licence for any activity relating to waste or hazardous waste management.
Atmospheric Pollution Prevention Ordinance (Act No.11 of 1976)	This Ordinance serves to control air pollution from point sources, but it does not consider ambient air quality. Any person carrying out a ‘scheduled process’ which are processes resulting in noxious or offensive gases typically

	<p>pertaining to point source emissions have to obtain a registration certificate from the Department of Health</p> <p>Although we do not anticipate the mining activities to generate excessive dust particles, the proponent should implement the necessary mitigation measures to limit dust emissions to air.</p>
Public Health Act (Act No. 36 of 1919)	<p>The Act serves to protect the public from nuisance and states that 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 proponent should ensure that the site workers are provided with protective gear to safeguard their wellbeing. The activities should also be conducted in a manner that does not pose any danger to the public and that any emissions which could be considered a nuisance remain at acceptable levels.</p>
Labour Act (Act No. 6 of 2007)	<p>The 1997 Regulations relating to the Health and Safety of employees at work sets out the duties of the employer, welfare and facilities at the workplace, safety of machinery, hazardous substances, physical hazards, medical provisions, construction safety and electrical safety. Specifically, no employer shall require or permit an employee to work in an environment that is deemed unfit without protective measures in place. The proponent as the employer should adhere with</p> <p>all the requirements of the Act and the associated Regulations.</p>

2. PROJECT DESCRIPTION

2.1 Project Locality

Nguni Zambezi Houseboat existing and operational Nguni Zambezi Houseboat project is located in within the Kasika Communal Area of Zambezi Region. It is operating within the Kaza Chobe-Zambezi River channels and the houseboat is often docked at an identified place for overnighting. The area for docking is in extent of 1 hectare.

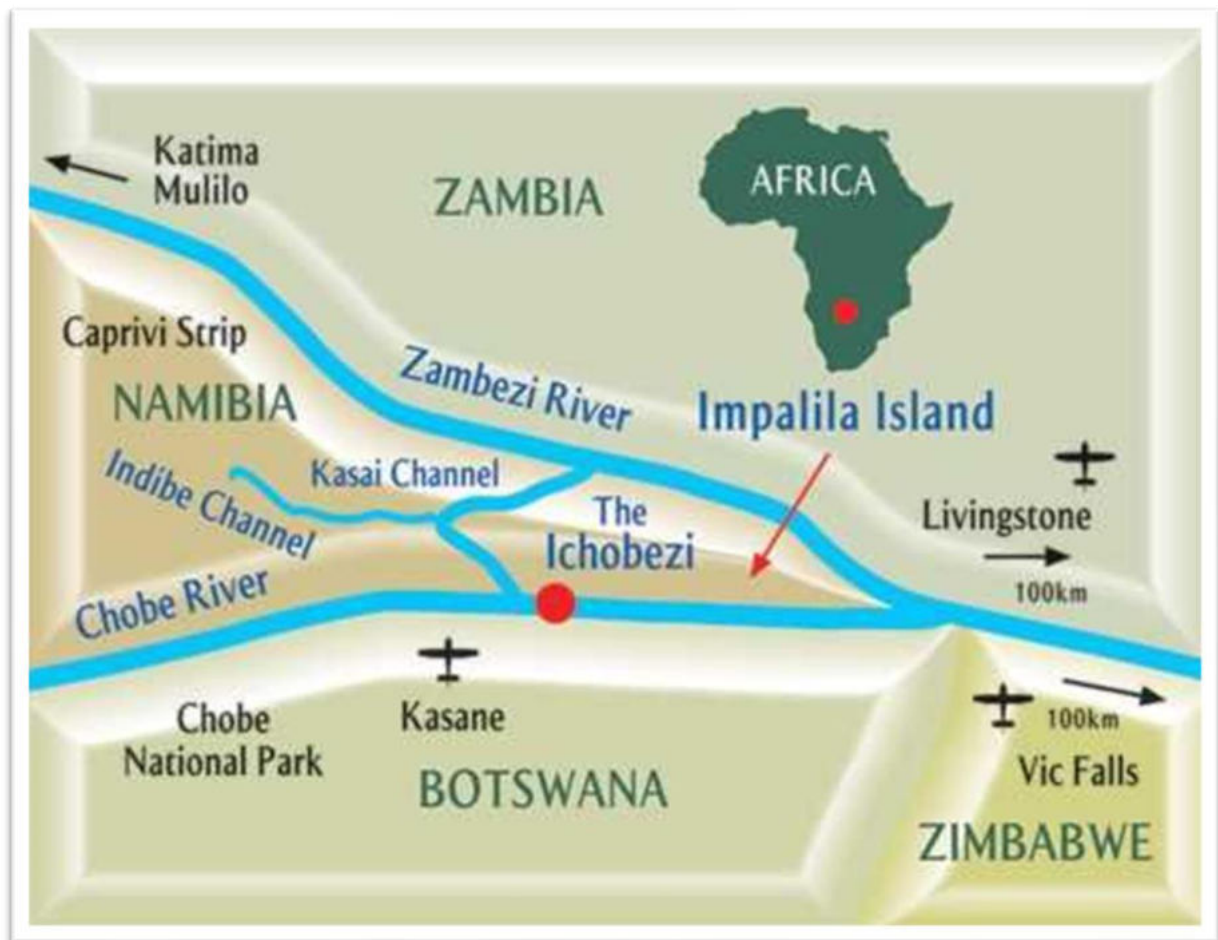


Figure 2: River channels & streams operation of the Nguni (Pangolin Voyager Houseboat)

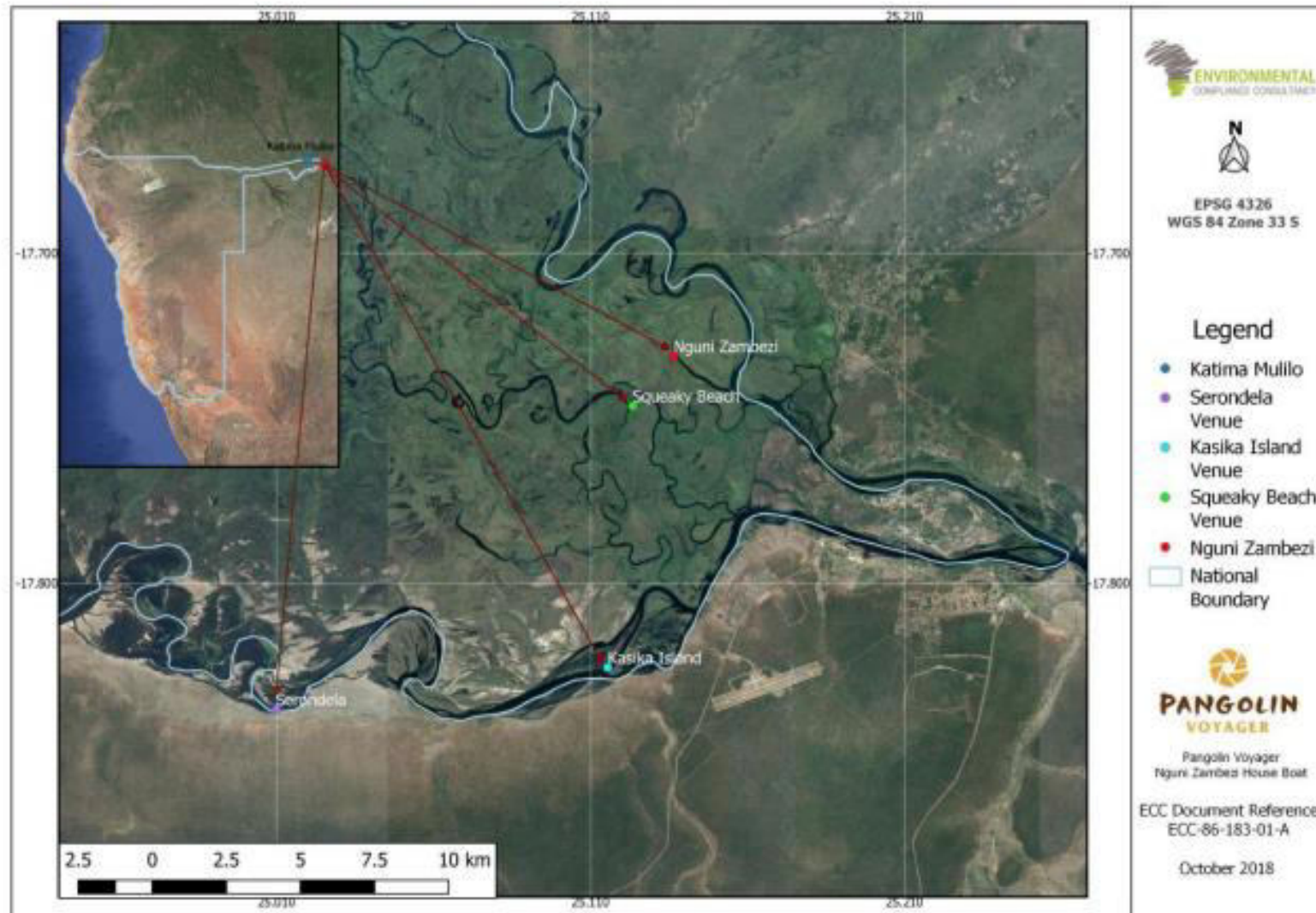


Figure 3: Location of Nguni Zambezi Houseboat and the operating areas

Source: Environmental Compliancy Consultancy, 2018



Figure 4: Nguni houseboat docking area

2.2 Houseboat Project Process

Nguni Zambezi Houseboat cc (The proponent) s hold the Environmental Clearance Certificate for the houseboat and is responsible for the implementation and management of this EMP. As the operations of the Houseboat continue to operate, the EMP shall be reviewed by the Houseboat Manager, and shall be amended and updated as required and approved ready for implementation. The implementation and management of this updated EMP and the monitoring of compliance shall continue to be undertaken through daily duties and activities and monthly inspections. The proposed Houseboat tourism business activities shall be operational on houseboat which include the following;

- Houseboat Kitchen & restaurant,
- Outdoor viewing desks
- Dining area
- Bathrooms & ten (10) sleeping rooms
- Small Administration office



Figure 5: Nguni (Pangolin Voyager Houseboat) internal build-up structure

The proponent Nguni Zambezi Houseboat CC is responsible for:

- Ensuring all members of the Project Team, including contractors and consultants comply with the procedures set out in this EMP
- Ensuring that all persons are provided with sufficient training, supervision and instruction to fulfil this requirement, and
- Ensuring that any persons allocated specific environmental responsibilities are notified of their appointment and confirm that their responsibilities are clearly understood.

2.3 Employment and Skills Development

The Proponent (Nguni Zambezi Houseboat cc) hires and have hired local Namibians from the Kasika, Impalila, Masubia and Bukalo Conservancies as a way of empowering and uplifting local residents' livelihood by through provision of jobs. The main objectives of this Employment and Skills Development Plan are to:

- Clarify employment and recruitment procedures of local community members
- Clarify and adhere to Employment targets
- Formulate plans for the development of skills of local employees, and
- Develop a framework for regulating Social Responsibility efforts, assistance programs, donation and community welfare efforts

3. ENVIRONMENTAL MANAGEMENT

3.1. Objectives And Targets

Environmental objectives for the operations of the houseboat are as follows:

- Zero pollution incidents
- Minimize waste sent to landfill or being burnt
- Protect local flora and fauna and minimize disruption
- Minimize light and noise pollution, and
- Use natural resources effectively and efficiently.

Procedures for monitoring processes against the project environmental objectives will be agreed with the Envi

3.2. Boating Safety Information

Houseboat safety management plan will be developed and implemented in accordance with the specifications of the houseboat and passenger water vessels in Namibia. A boating map of the proposed portion of the river will be navigable areas and points of interest along the river. The map will also contain useful boating information as well as an index and GPS reference.

3.4 Infrastructure

Apart from the Houseboat, Nguni Zambezi House Boat cc project does not comprise of any major immovable infrastructure development as the project design and model is based on a mobile Houseboat with inclusive and integrated services. As a result, no changes or amendment in terms of houseboat structural design, infrastructure upgrading or infrastructure development was conducted. Hence all infrastructural services remain the same.

3.5 Pollution Control & Mitigations

3.5.1 Handling of Fuel, Oil and Chemicals

The Houseboat Manager takes all reasonable precautions to prevent fuel, oil and chemical whilst undertaking works on site. To this end, the Site Manager ensures that:

- All necessary approvals are in place prior to bringing fuel, oil or chemicals to the houseboat
- All fuel, oil and chemical deliveries (if any) shall be supervised by a responsible person, who shall be trained to deal with any spills
- Regular checks are performed to verify that no leaking or defective equipment, and
- Equipment is maintained regularly to ensure that no fuel, oil or hydraulic leaks occur.

The Houseboat Manager often ensures that there is sufficient absorbent material and spill kits available on site to manage accidental spills. The location of and instructions on how to use this equipment shall be included in the Induction. Nominated personnel will be appropriately trained to use spill kits. Any accidental spillages of fuels and oils, or other hazardous substances, are usually cleaned up immediately and be reported Houseboat Manager and Environmental Officer. The following responses shall be undertaken:

Minor spill: Only diesel and oil, with no human injury, contamination to water bodies or other environmental receptors. Contain and clean up the spill using available spill kit. The Houseboat Manager shall inform the PM and Environmental Officer, supplying the following information:

- o Date, time, and location
- o Substance spilled and quantity, and
- o Actions taken, and any future remediation required.

Major Spill: Resulting in human injury or/and environmental contamination and water body contamination. Personnel will contain the spill if possible and report the spill to the Houseboat Manager, who shall then alert the appropriate emergency services and the Environment Officer. In addition to the above information for a minor spill, the Houseboat Manager is also informed of any immediate dangers, e.g., fire, explosion, release of chemical fumes.

3.5.2 Sewerage and Greywater

The houseboat will and/or often use a completely closed solid waste management system to ensure that no solid waste or untreated sewage is discharged into the river. About 2 000 liters of Wastewater is pumped from the houseboat stainless steel holding tanks on a daily basis and transported to the on-land Zambezi Queen Wastewater Treatment Plant. Thus, no water is released into the river. The system is designed to service up to +- 13, 000 liters of sewerage per day, before discharging the effluent through sprinklers.

Nguni Zambezi House Boat have ascertained that all the necessary documentations, permits and measures are in place before discharge of wastewater or effluent is made. Thus, a discharge permit was and/or will be applied for at the Department of Agriculture Water and Forestry for the operations of this system and discharge to the environment. In the letter, comply with the set conditions of the permit (upon approval), to ensure that the effluent quality conforms with the prescribes general standards. Moreover, the effluent is often contained on the houseboat and pumped into the existing on-land waste water treatment plant for further treatment.

3.5.3 General Waste

The houseboat is equipped with designated rubbish bins to ensure that all domestic waste is collected and disposed of sustainably through the existing waste management arrangements. Waste separation is and will continue to be practiced, to ensure that all recyclable material is collected and sent for recycling. It is recommended that the houseboat produce a Waste Management Plan. The EMA (2007), Section 3, paragraph (i) states that waste must be reduced, re-used and recycled where possible, therefore in

accordance with the Act, waste generated as a result of operating the houseboat is often managed and dealt with in accordance with a Waste Management Plan. This Plan was produced prior to operations of the houseboat commencing and included the following information:

- Describe each waste type expected to be produced
- Estimate the quantity of each waste type
- Identify the waste management action proposed for each waste stream, including re-using, recycling, recovery and disposal
- Designated areas to collect and separate waste, and
- Identify waste carrier and waste disposal company.

The Waste Management Plan was and is updated on a regular basis to ensure all waste and disposal route are identified. The aim of the Waste Management Plan is to achieve sustainable waste management. Their main purpose is to outline waste streams and identify the best treatment and disposal option for each one, applying the waste management hierarchy and avoiding as much waste as possible ending up at landfill or being burnt. In addition, it will also outline any potential economical and investment requirements for the treatment and / or disposal of waste.

3.5.4 Environmental Monitoring

Monitoring during operations is and shall be undertaken to ensure the effects on society and the environment are minimized, and to evaluate how effective the environmental management has been, over an extended period of time. The Houseboat Manager will set out monitoring arrangements prior to the operations of the Houseboat.

4. ROLE PLAYERS & RESPONSIBILITIES

This section outlines the roles and responsibilities of the respective key personnel that would be responsible for effective implementation of the EMP.

4.1 Roles and responsibilities

Assigning responsibilities is necessary to ensure that key procedures are followed. The overall responsibility to ensure that the EMP is implemented rests with the Site Houseboat Manager, who shall appoint a team of workers to undertake the actual work.

The Key role-players for the project implementation are:

- a) An Environmental Compliance Officer (ECO) representing MET for environmental auditing and monitoring;
- b) The Site Houseboat Manager (or assigned representation by Nguni Zambezi House Boat cc)

All instructions and official communications regarding environmental matters shall follow the organizational structure as determined by Nguni Zambezi Houseboat cc. The only exception to this rule would be in an emergency (defined as a situation requiring immediate action and where failure to intervene timeously would, result in unacceptable environmental degradation), where instructions may be given directly to any other Site personnel.

Project development Houseboat Manager:

The Site Houseboat Manager is and will be responsible for the overall daily operations at the Houseboat facility and shall be responsible to adherence to the EMP throughout the project span. All team members shall be well-versed with the contents of this document.

The following are some **key responsibilities;**

- Ensure that the works on-site (houseboat) are conducted in an environmentally sensitive manner and in accordance with the requirements of the EMP at all times. Special care shall be taken to prevent irreversible damage to the environment.
- Ensure that all site houseboat staff are adequately informed of the requirements of the EMP pertaining to their site role, and that they have attended an environmental induction session (this session was and will be in the form of a talk and/or a written code of conduct that is clearly explained and understood by the team).

The Environmental Compliance Officer: ECO

The ECO in the context of this document refers to the party responsible for the environmental compliance and auditing activities required by the EMP for the lifecycle of the Site. The ECO shall be an independent environmental manager. The ECO shall have adequate environmental knowledge to understand the detailed environmental issues associated with the project, and is to be well versed in the contents of the EMP:

- The ECO shall undertake all monitoring and auditing activities to ensure compliance with the EMP.
- The ECO shall inspect the site at any suitable time during operation of the Houseboat
- The ECO shall compile progress reports following any site inspections, Compliance Reports following any non-compliance, and a Closure report following the conclusion of houseboat activities.
- The ECO shall liaise closely with the Site Houseboat Manager and shall provide guidance on any environmental management issues, incidents or emergencies that are brought to their attention.
- The ECO shall assist in providing recommendations for remedial action in the event of any non-compliances.

4.2 Compliance with Requirements

Environmental management is not only concerned with the impacts on the environment, but also with how such operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations as well as the wellbeing of the immediate communities

The development of an updated EMP for a project is therefore an important and necessary task that is aimed at assigning responsibilities and mitigation options to a variety of activities. However, it can also be an ineffective tool in the absence of auditing or monitoring activities. Auditing or monitoring activities involve the structured observation, measurement, and evaluation of environmental data over a period of time.

4.4 Disciplinary Action

The EMP is a legally binding document. Non-compliance with the EMP shall result in disciplinary action being taken against the perpetrator/s. Such action may take the form of (but is not limited to) financial penalties, legal action, fines and/or suspension of work. The disciplinary action shall be determined according to the nature of the non-compliance or crime, and exact penalties are to the discretion of MEFT (Ministry of Environment, Forest and Tourism) according to the severity of the incident. Measures to be implemented by Nguni Zambezi House Boat cc with assistance of monitoring by the ECO are outlined in the table below.

ASSESSMENT OF ENVIRONMENTAL ASPECTS AND PROPOSED MITIGATION MEASURES TO BE PERFORMED BY THE CONTRACTOR AND PROPONENT DURING ALL PHASES OF THE PROJECT (NGUNI ZAMBEZI HOUSEBOAT CC)

An environmental review for the operations of the houseboat is and/or has been completed to identify all the commitments and agreements made within the EIA report. From this, a schedule of environmental commitments and risks has been produced, which details deliverables including measures identified for the prevention of pollution or damage to the environment.

ACTIVITY	RISKS AND POTENTIAL IMPACTS	MANAGEMENT / MITIGATION MEASURES	MONITORING REQUIREMENTS	FREQUENCY	RESPONSIBILITY
Refueling tender boat and houseboat's generator	Spillages of fuel, oil and lubricants.	Activity undertaken by a suitably qualified person Spill kits available Use of dips trays during the transfer	Monitor fuel use	Daily	Houseboat Manager Personnel
Operations of mechanical equipment and engines	Spillages of fuel, oil and lubricants.	Undertake regular checks of all plant and equipment Service plant and equipment annually Spill kits available Clear spills immediately	Daily checks Monthly inspections / compliance checks	Daily Monthly	Houseboat Manager Personnel
Increased tourists to the area and taking part in activities – use of generators, engines and general noise sources	Increase noise levels	Boat engine and moving components are to be kept in good working order at all times to avoid capsizing and to minimize noise impact Guests are to be provided awareness on interactions and impacts on aquatic ecology No loud music Careful siting of generators Turn off engines when not required No idling	Daily checks Monthly inspections / compliance checks	Daily Monthly	Houseboat Manager Personnel
Increased tourists to the area and taking part in activities / houseboat in close proximity to animals	Human-wildlife conflicts – animal injury, disturbance or mortality	Train personnel and guides Provide environmental awareness to guests No-go areas on the river Limit the number of tender boat on the river at any one time Prevent killing of animals No stopping on the river unless approved by the Environmental Officer	Monthly checks of environment	Monthly	Houseboat Manager or Environmental Officer

Abstraction of water from the river	Disturbance to the natural environment and use of resources	Train personnel and environmental awareness - minimize use of water Inform guests of water usage and consumptions issues / use water wisely Maintenance of plant and equipment – no leaks	Test water annually to ensure it is appropriate for consumption	Annual	Houseboat Manager or Environmental Officer
Sewerage production and disposal	Reduction in water quality Flora and fauna affected	Sewerage waste treatment plant onboard each boat Sampling Maintenance of plant	Regular checks on the waste treatment facility. Regular water samples will be taken from those boat to ensure the treated water quality comply with the prescribes general standards	Daily Monthly	Houseboat Manager or Environmental Officer
Production and disposal of greywater (showers and kitchen operations) Use of chemicals	Reduction in water quality Flora and fauna affected	All of the sinks, showers, and toilets on each Houseboat will drain into a specially designed greywater tank. The capacity of this tank will accommodate all waste produced within the houseboat. Water to be treated prior to discharge to the river. Use environmentally friendly products Minimize use of chemicals. Regular water quality samples must be taken to ensure the treated waste water comply to the prescribed general standards as set out in the Water Resources Management Act, 2004 (Act No. 24 of 2004). Should the treated waste water not meet the prescribed general standards, the discharge of the treated waste water may not be discharged into the environment.	Regular water quality samples	Weekly / monthly	Houseboat Manager or Environmental Officer

Increased tourists - Increased waste	Solid waste (litter) escaping into the environment. Greater quantity to be disposed of – landfill = land take, burning = air pollution	Implementation of the Waste Management Plan and application of the waste management hierarchy Suitable collection points for the waste on houseboat Waste collected weekly and transported in suitable containers. Any hazardous waste such as waste oil/lubricant cans should be stored in a hazardous waste storage bin and disposed of by an accredited hazardous waste handlers such as Ventclean, Rent A Drum and Kleen Tech.	Monthly compliance checks	Monthly	Houseboat Manager Houseboat personnel
Increased tourists – Food introduced into the ecosystem	Change in the local flora and fauna, and habits of aquatic species	Notices to inform guests of the rules Appropriate bins and removal of waste each day	None	None	Houseboat Manager Houseboat personnel
Houseboat Maintenance or renovations	Oils, fuels, chemicals paints, waste entering the aquatic environment and causing pollution / contamination – reduce water quality, affect flora and fauna	Implementation of the Waste Management Plan Suitable collection points for the waste on houseboat Waste collected daily and transported in suitable containers Spill kits Limit use of chemicals Training of staff	Monthly compliance checks None	Monthly	Houseboat Manager or Environmental Officer
Lighting from the houseboat	Artificial lighting could affect birds and fish in particular, as these species rely upon moonlight to navigate at night time. Amphibians, such as frogs could also be disturbed, and feeding and mating rituals could be affected. Sources	Use of energy efficient light forms Low beam / low LEDs Avoid lighting where unnecessary Avoid lights being grouped together. Lights switched off at night	Monthly compliance checks	Monthly	Houseboat Manager or Environmental Officer

Maintenance of area in the vicinity of the houseboat	Removal of vegetations	Remove invasive alien species Remove vegetation during the winter months or prescribed times by the Environmental Officer	Monthly checks to visually check the growth of vegetations	Monthly	Houseboat Manager Environmental Officer
Increased number of guests and operations	Water Resources: Use of Energy and waste production	Train staff so they are aware of the need to save energy Inform guests and include information on the houseboat Use of energy wisely – solar power (ensure well maintained) and energy saving lightbulbs	Monitor fuel use. Monitor energy consumption and water abstraction Monitor waste as part of waste management plan	Monthly	Houseboat Manager or Environmental Officer
Location of Houseboat	Geomorphology and ecological impacts	The houseboat shall be moored at the same location which will not move during operations. These sites have been identified and shall not be deviated from except is sensitive environmental features are located in the area and the mooring spot needs to be moved by a few meters.	Weekly and monthly compliance checks	Weekly and monthly	Houseboat Manager

.....
Nyepuz Consultancy CC
Environmental and Management Consultant