



**ENVIRONMENTAL MANAGEMENT PLAN FOR THE  
CONSTRUCTION AND OPERATIONS OF AN ABATTOIR FOR A  
PIGGERY ON FARM ORIBIB 33A AT OTJIKONDO, OUTJO KUNENE  
REGION**



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## ACRONYMS

<b>DEA</b>	Department of Environmental Affairs
<b>EAP</b>	Environmental Assessment Practitioner
<b>EAR</b>	Environmental Assessment Regulations
<b>EIA</b>	Environmental Impact Assessment
<b>EMA</b>	Environmental Management Act
<b>EMP</b>	Environmental Management Plan
<b>ECC</b>	Environmental Clearance Certificate
<b>ESA</b>	Environmental Scoping assessment
<b>I&amp;AP</b>	Interested and affected parties
<b>MAWLR</b>	Ministry of Agriculture, water, and Land Reform
<b>NGS</b>	Nam Geo-Enviro Solution

## **1. INTRODUCTION**

The following Environmental Management Plan (EMP) has been developed specifically for the proposed construction and operations of an abattoir for a piggery on Farm 33A at Otjikondo, Outjo, Kunene Region.

The EMP is an onsite working document which consists of a sets of mitigation measures to address potential impacts to acceptable levels during the construction and operational phase. All contractors and subcontractors taking part in the project should be made aware of the contents of the EMP.

## **2. OBJECTIVES**

The environmental management plan (EMP) aims to take a pro-active route by addressing potential problems before they occur. The objectives of the EMP are, therefore:

- To outline mitigation measures to manage environmental and socio-economic impacts associated with the project
- Provide a framework for implementing the management actions.
- To ensure that the project will comply with relevant environmental legislations of Namibia and other requirements throughout its operation.
- To promote sustainable development.

## **3. LEGAL FRAMEWORK: LEGISLATIONS, POLICIES AND GUIDELINES**

This section outlines the regulatory framework relevant to the proposed project. All identified crucial pieces of legislation should be adhered to, as indicated in their respective pieces of legislation. Where there is a need to engage private consultants to facilitate compliance, the proponent is encouraged to consult qualified and certified personnel.

The Environmental Management Act No. 7 of 2007 is the primary custodian of the environment which aims to; promote 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 activities which may have significant effects on the environment and to provide for incidental matters. However, this section does not only focus on the EMA, but also looks at other relevant legislatives.

**Table 1: Regulatory Framework relevant to the project**

Aspect	Regulations	Relevant Provisions	Relevance to the Project
<b>The Constitution</b>	<b><i>The constitution of Namibia (1990) First Amendment Act 34 of 1998</i></b>	<p>-“The State shall actively promote and maintain the welfare of the people by adopting policies that are aimed at maintaining ecosystems, essential ecological processes and the biological diversity of Namibia.</p> <p>-It further promotes the sustainable utilisation of living natural resources basis for the benefit of all Namibians, both present and future.” (Article 95(I)).</p>	Through implementation of the EMP, Chakula Foods CC should ensure conformity to the constitution in terms of environmental management and sustainability.
<b>Environment</b>	<b>Environmental Management Act no. 7 of 2007</b>	<p>-Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27).</p> <p>-Requires adequate public participation during the environmental assessment process for interested and affected parties to voice their opinions about a project (Section 2(b-c)).</p> <p>-According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site declared by the Minister of Environment and Tourism or in a manner prescribed by the Minister.</p>	<p>This Act and its regulations should inform and guide this EIA process.</p> <p>The project proponent should ensure that all provisions of the EMP are implemented, and regular environmental compliance monitoring and evaluation are conducted.</p>

		Details principles which are to guide all EIAs.	
	<b>EIA Regulations GN 2007 (no.30 of 2012)</b>	-Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). -Details the requirements for what should be included in a Scoping Report (GN No 30 S8) an EIA report (GN No 30 S15).	These regulations should inform and guide this EIA process.
<b>Meat Industry</b>	<b>Meat Industry Act 12 of 1981</b>	-A producer of any controlled product (livestock, meat, or meat products) must be registered with the Meat Board of Namibia and must comply with the conditions of registration to lawfully sell any controlled product.	The proponent should be registered with the Meat Board of Namibia.
	<b>Prevention of Undesirable Residue in Meat Act 21 of 1991</b>	- This Act provide for control over the administration of certain products to animals which may cause undesirable residue in meat and meat products; to further regulate the slaughtering of animals and the marketing of meat and meat products; and to provide for incidental matters.	The abattoir should be established in accordance with provisions this act.
	<b>Animal Identification Regulations: Animal Diseases And Parasites Act, 1956</b>	-The purpose of these regulations is to help the prevention, control and eradication of animal disease and parasites by implementing a livestock identification and traceability system through requirements that create the capacity to trace the origin,	The proponent should ensure that diseased animals or parasite infested animals are not processed and or sold by the entity.

		movements, and fate of designated animals.	
<b>Waste</b>	<b>National Waste Management Policy</b>	<p>-The National Waste Management Policy gives guidelines on the disposal methods and techniques for the different types of waste.</p> <p>-The policy guidelines were useful in assessing alternative waste treatment methods such as autoclaving and chemical sterilization among others.</p>	The solid waste disposal method should be adopted.
	<b>National Solid Waste Management Strategy</b>	<p>Details that the waste collection system at most municipalities is generally operating to an adequate standard compared to waste disposal. However, there is scope for improvement in waste collection at all municipalities, related to waste collection coverage in informal housing areas.</p> <p>Dumping and litter in the areas under the administration of regional councils are a major.</p>	The proponent should ensure that the waste is handled correctly and disposed of at an approved site.
	<b>Pollution and Waste Management Bill (draft)</b>	<p>This bill defines pollution and the different types of pollution. It also points out how the Government intends to regulate the different types of pollution to maintain a clean and safe environment.</p> <p>The bill also describes how waste should be managed to reduce environmental pollution. Failure to comply with the requirements is</p>	<p>The proponent should be executed in harmony with the requirements of the act to reduce negative impacts on the surrounding environs from waste.</p> <p>A waste management strategy that follows recycling, reuse and reducing will be commissioned throughout the activities.</p>

		considered an offense and is punishable.	
<b>Soil</b>	<b>Soil Conservation Act 76 of 1969</b>	This act makes provision for combating and prevention of soil erosion, it promotes the conservation, protection and improvement of the soil, vegetation, sources, and resources of the Republic of Namibia.	The project impact on soil will be localised; however, this document aims at guiding the proponent to prevent soil erosion during construction phase and contamination during operation phase
<b>Biodiversity</b>	<b>National Biodiversity Strategy and Action Plan (NBSAP2)</b>	The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia, putting together the management of matters to do with ecosystems protection, biosafety, and biosystematics protection on both terrestrial and aquatic systems.	Forming part of the EIA and EMP for this project, the proponent will consider all associated impacts, both acute and long term, and will propose methods and ways to sustain the local biodiversity.
<b>Waste</b>	<b>Hazardous Substance Ordinance 14 of 1974</b>	Provisions for hazardous waste are amended in this act as it provides “for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the prohibition and control of the importation, sale, use, operation, application, modification, disposal or dumping of such substance; and to provide for matters connected therewith”	The proponent should ensure that all possible “hazardous” categorised substances and waste will be handled by a certified hazardous waste handler.



<b>Pollution</b>	<b>Atmospheric Pollution Prevention Ordinance 11 of 1976;</b>	<p>-This regulation sets out principles for the prevention of the pollution of the atmosphere and for matters incidental thereto. Part III of the Act sets out regulations pertaining to atmospheric pollution by smoke. While preventative measures for dust atmospheric pollution are outlined in Part IV and Part V outlines provisions for Atmospheric pollution by gases emitted by vehicles.</p>	<p>The proposed construction activities will involve the use of combustible engines for vehicles and machinery, and thus appropriate vehicle servicing should be ensured to minimise pollution.</p> <p>Dust generation and release of other particulate matter should be minimised by following the dust suppression procedures in the EMP.</p>
<b>Water</b>	<b>Water Act 54 of 1956</b>	<p>-The Water Resources Management Act 24 of 2004 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force:</p> <p>-A permit application in terms of Sections 21(1) and 21(2) of the Water Act is required for the disposal of industrial or domestic wastewater and effluent.</p> <p>-Prohibits the pollution of underground and surface water bodies (S23 (1)).</p> <p>-Liability of clean-up costs after closure/ abandonment of an activity (S23 (2)).</p> <p>-Protection from the surface and underground water pollution.</p>	<p>The proponent should comply to the provisions of this act.</p>
	<b>Labour Act (No 11 of 2007) in conjunction with Regulation 156, 'Regulations Relating to the Health and Safety</b>	<p>-135 (f): "the steps to be taken by the owners of premises used or intended for use as factories or places where machinery is used, or by occupiers of such premises or by users</p>	<p>The proponent will employ several people and shall ensure securing a safe environment and preserving the health and welfare of employees at work. This will include applying appropriate</p>

	<b>of Employees at work’.</b>	<p>of machinery about the structure of such buildings of otherwise to prevent or extinguish fires, and to ensure the safety in the event of a fire, of persons in such building;” (Ministry of Labour and Social Welfare).</p> <p>-This act emphasizes and regulates basic terms and conditions of employment, it guarantees prospective health, safety and welfare of employees and protects employees from unfair labour practices.</p>	<p>hazard management plans and enforcing Occupational Health and Safety (OHS) enforcement by contractors.</p>
	<b>Public Health and Environmental Act, 2015</b>	<p>-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.”</p>	<p>The proponent should ensure compliance with the terms of the Act.</p>
	<b>Road Ordinance 1972 (Ordinance 17 Of 1972)</b>	<p>-Width of proclaimed roads and road reserve boundaries (S3.1)</p> <p>-Control of traffic during operational activities on the trunk and main roads (S27.1)</p> <p>-Infringements and obstructions on and interference with proclaimed roads. (S37.1)</p> <p>-Distance from proclaimed roads at which fences are erected (S38)</p>	<p>The project will ensure compliance with the terms of the Road Ordinance.</p>

	<p><b>The Regional Councils Act (No. 22 of 1992)</b></p>	<p>This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described in section 28 “to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment. -The main objective of this Act is to initiate, supervise, manage, and evaluate development.</p>	<p>The relevant Regional Councils are I&amp;APs and must be consulted during the Environmental Assessment (EA) process.</p>
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## **INTERNATIONAL CONVENTIONS AND PROTOCOLS RELEVANT TO THE PROJECT**

It is vital to note that there are international conventions and protocols which aim to protect the environment to which Namibia is a signatory. These various international conventions and protocols which relate to the project are listed below:

- Vienna Convention for the protection of the ozone layer, 1985.
- United nations framework convention on climate change 992.
- Convention of Biological Diversity (1992).
- African Convention on the Conservation of Nature and Natural Resources (1968)

## **SUSTAINABILITY PRINCIPLES RELEVANT TO THE PROJECT**

Apart from the above-mentioned regulatory framework, the following sustainability principles need to be taken into consideration, particularly to achieve proper waste management and pollution control.

### **CRADLE TO GRAVE RESPONSIBILITY**

This principle states that those who manufacture potentially harmful products should be liable for their safe production, use, and disposal. Those who initiate potentially polluting activities should be legally responsible for their commissioning, operation, and decommissioning.

### **PRECAUTIONARY PRINCIPLE**

This principle states that if there is any doubt about the effects of a potentially polluting activity, a cautious approach should be adopted.

### **THE POLLUTER PAYS PRINCIPLE**

A person who generates waste or causes pollution on the environment should pay the costs of pollution including the costs of preventing further damages.

## **4. CERTIFICATIONS REQUIRED FOR THIS PROJECT**

Permits and licenses are required, as part of compliance and authorization. All permits and licenses should be obtained before commencement of the project. The most crucial licenses to be acquired are as follows.

**Table 2.** List of certifications required and their relevant authority

<b>Licence/Permit</b>	<b>Authority</b>	<b>Status</b>
Registration of an Abattoir with the Meat Board of Namibia	Meat Board of Namibia	To be acquired
Licence to discharge effluent	Ministry of Agriculture Water and Land Reform	To be acquired
Licence for water abstraction and use	Ministry of Agriculture Water and Land Reform	To be acquired
ECC	Ministry of Environment Tourism	EIA in progress

## **5. ROLES AND RESPONSIBILITIES**

This section describes the roles and responsibilities of the key stakeholders involved in the development, implementation, and reviewing of the EMP for the proposed project. The proponent should ensure the appointment of responsible personnel such as an Environmental Control Officer, Project Manager and Health and Safety Officer to ensure the successful implementation of the EMP.

### **5.1 COMPETENT AUTHORITIES**

The Ministry of Agriculture, Water and Land Reform and Department of Environmental Affairs: Ministry of Environment, Forestry and Tourism are the competent authorities for this project. They are responsible for reviewing the EMP and issuing of the ECC.

### **5.2. PROPONENT (CHAKULA FOODS CC)**

- Chakula Foods CC should delegate suitably qualified person(s) with the responsibility to ensure implementation of the EMP.
- Protect and rehabilitate the environment.
- Give warnings and impose fines and penalties on the Contractor if the Contractor neglects to implement the EMP satisfactorily.
- Make sure that a copy of the EMP is readily available on-site and that all site staff are aware of its content.

### **5.3 APPOINTED CONTACTOR**

- The contractor is responsible for the implementation of the EMP.
- Should be aware of any environmental matters as deemed necessary by the contractor.
- The Contractor shall take adequate steps to educate all members of his workforce as well as his supervisory staff on the relevant environmental laws and protection requirements as described in the EMP.
- Acquire a basic understanding of the key environmental features on the site and its immediate environs.
- Make sure that a copy of the EMP is readily available on-site and that all site staff are aware of its content.

### **5.4 PROJECT MANAGER**

- Liaising directly with the Environmental Control Officer (ECO) concerning the preparation and implementation of the EMP and meeting the conditions documented in the environmental clearance certificate.
- Bear the overall responsibility for managing the project contractors and ensuring that the environmental management requirements are met.

- Inform the contractors of the EMP and Environmental clearance certificate obligations.
- Approve all decisions regarding environmental procedures and protocols that must be followed.
- Have the authority to stop any activities in contravention with the EMP.
- In consultation with the Environmental Control Officer has the authority to issue fines for transgressions of basic conduct rules and/or contravention of the EMP.
- Maintain open and direct lines of communication between the proponent and Interested and Affected Parties (I&APs) about environmental matters.
- Attend regular site meetings and inspections where required.

#### **5.5. ENVIRONMENTAL CONTROL OFFICER**

- Required to conduct inductions of the EMP and ensure implementation of required measures and conditions.
- Conduct environmental monitoring as per EMP requirements.
- Monitor the performance of the contractors and ensure compliance with the EMP.
- Maintain, update, and review of the EMP.
- Communicate all amendments of the EMP to the relevant stakeholders.
- Liaison between the contractor, authorities, and other key stakeholders on all environmental concerns.

#### **5.6. OCCUPATIONAL HEALTH AND SAFETY OFFICER**

- Ensure that safety is practiced for all activities on site.
- Conducting incidents investigation as well as coming up with corrective and preventative actions.
- Prepare and implement safety procedures
- Communicate all safety-related issues.
- Carry out any incident/accident investigations at the site
- Conduct training
- Recording accidents and incidents at the site
- Issuing PPE to employees
- Carry out Safety Health and Environmental awareness inductions, the following topics, at least but not limited to, should be covered, (the importance of complying with the relevant Namibian and International legislation, roles, and responsibilities including emergency preparedness, basic rules of conduct the Do's and Don'ts.

## **6. MANAGEMENT OF PROJECT IMPACTS**

In this section, project impacts and their mitigation measures are stipulated. The proponent and all appointed contractors should ensure proper implementation of these measures.

Before commencement of any work, all staff should be informed of the content of the EMP. The proponent, contractor, project manager and HSEO have the responsibility for implementing the EMP and ensuring their staff members comply with the guidelines.

## **NEGATIVE IMPACTS**

### **1. IMPACT ON BIODIVERSITY**

Biodiversity loss is likely to occur during construction phase due to earthworks. Animal habitats (vertebrates and invertebrates) might be affected; however, this impact will be localised.

#### **MITIGATION MEASURES:**

- Massive clearing of vegetation shall not be allowed.
- Avoid the killing of species viewed as dangerous such as various snakes – when on site.
- Off-road driving should not be allowed, and only existing tracks should be used to avoid trampling of organisms of conservation concern.
- The base camp should be set up in a less ecological sensitive area.
- Stick to speed limits.
- No capturing of animals and littering.
- Remove and relocate slow-moving vertebrate fauna (e.g., tortoise, chameleon, etc) to suitable habitat elsewhere on the property.
- Avoid introducing ornamental plants, especially potential alien species as part of the landscape of the campsite, but rather use localized indigenous species, should landscaping be attempted, which would also require less maintenance.
- The machinery and equipment which emit excessive noise should be limited and restricted to certain hours only.
- No campsite should be permitted outside designated areas.
- No operation of any kind should be allowed after dusk.

## **2. DUST**

Dust will be produced during construction phase. This might affect the workers and adjacent areas. Dust particles can penetrate the human body and can cause respiratory tract irritation, illness (such as asthma attack, cough, and bronchitis), and eczema if they are exposed to high amounts of dust.

### **MITIGATION MEASURES:**

- Personnel are required to wear personal protection equipment such as respirator if excessive dust is created for prolonged working periods.
- Use of dust suppression method such as sprinkling of water.
- Speeds limits on-site should be restricted to below 40km/hr to generate minimal dust.
- As per World Health Organisation (WHO), the dust particulate matter should be in the range of 150-230  $\mu\text{g}/\text{m}^3$  on an annual average and 60-90  $\mu\text{g}/\text{m}^3$  on a 24-hour average.
- Construction warning signs and heavy vehicle visibility methods should be implemented during construction period to alert people and traffic frequenting the area.

## **3. AIR QUALITY (ODOUR)**

Abattoirs are believed to emit bad odour during operation phase. The odour is mostly emitted from paunch contents and blood residues from the slaughterhouse. Livestock transport vehicles entering the abattoir may also cause odour problems.

### **MITIGATION MEASURES:**

- Ensure meat and meat products are kept at correct cold storage temperatures.
- The bins used for manure storage should be emptied regular.
- Manage wastewater efficiently through regular maintenance wastewater systems.
- Ensure that discharging of blood sump pump into the storage vessel is in a closed circuit to ensure that there are no spillages, if there are spillages, they must be cleaned up immediately and disposed of into sealed waste bins.
- Blood removal circuit equipment must be well maintained.
- Ensure lairages are dry and cleaned daily to remove manure and that it is stored in the closed bins provide.
- Manage meat waste correctly by placing in black plastics and disposing of it at a licensed meat waste handling site.
- Ensure sufficient washing of floors and equipment.
- Maintain good housekeeping.



- Heaping of paunch content should be done in a place away from residential areas and should not be piled up for long.
- Condemned meat pit should have an air-tight cover to avoid release of foul smell.
- Plant more suitable trees along the perimeter fence and open spaces that will act as wind breakers and hence reduce the effects of wind in spreading odour to the area residents.

#### **4. ABATTOIR EFFLUENT (IMPACT ON SURFACE AND GROUND WATER)**

Surface and groundwater are the most readily available yet the most polluted because of anthropogenic activities, however these activities are controllable. Typically, dirty water and hazardous waste are the main sources of ground and surface water contamination. Abattoir activities may be another source of pollution since human activities such as animal production and meat processing have been reported to impact negatively on the soil and natural composition leading to pollution of the soil, natural water resources.

The waste generated from abattoirs usually comprise blood, oil, mineral and organic solids, salts and chemicals added during handling operations. Abattoir wastewater could significantly intensify the amounts of nitrogen, phosphorus, and total solids in the receiving water body. Effluent from abattoir may create substantial environmental and public health hazards.

The abattoir effluent for this project will be treated and reused for irrigation purposes.

#### **MITIGATION MEASURES:**

- Develop a waste management plan.
- A no-go buffer area of at least 50 m should be allocated to any water bodies in the area.
- No dumping of waste products of any kind in or near any surface water bodies. Contaminated runoff from the various operational activities such as greases, fuels, oils etc.
- Effluent should be prevented from entering any surface or ground water bodies. Where leakage or spillages occur, they should be dealt with immediately and appropriately.
- Ensure that surface water accumulating on-site are channelled and captured through a proper storm water management system to be treated in an appropriate manner before disposal into the environment.
- Wastewater should not be discharged directly into the environment.
- Ablution facilities must be flush-type and be linked to the Septic Tank.

- The service infrastructure should be designed and constructed by suitably qualified engineering professionals.
- Develop and implement a preventative maintenance plan for the service infrastructure.
- Drip trays must be placed underneath heavy vehicles and machinery when not in use to contain all oil that might be leaking from this equipment.
- Should it be necessary to wash equipment this should be done at an area properly suited and prepared to receive and contain polluted water
- All wastewater infrastructure should be checked for leaks in a regular basis.
- All wastewater and storm water infrastructure should be maintained at the recommended interval to ensure that they are working as design or intended.
- In the instant of accidental oil and fuel spill, the effluent should be contained.
- No burial of any waste or burning should be done on-site.
- Waste oils and fuels from drip trays on stationery vehicles and machinery should be disposed of as hazardous waste at a licensed facility by an authorized hazardous waste handler.

## **5. OUTBREAK OF ANIMAL DISEASES**

Infections that are naturally transmitted from vertebrates' animals to humans and vice versa are classified as zoonoses and animals can carry a wide range of zoonotic pathogens. These pathogens are normally present in slaughtered stock, raw hides/skin, blood, meat, and the farm environments, but are often difficult to diagnose.

Zoonoses can be transmitted to humans by several routes that include consumption of infected meat, direct contact with infected animals through slaughters and indirectly from infected farm environments. However, most meat-borne zoonoses are acquired through the consumption of infected and under cooked blood and meat

### **MITIGATION MEASURES:**

- The proponent must procure a meat inspection service for the abattoir.
- Meat inspection services may only be performed by qualified meat inspectors, examiners, or animals' health technician.
- An abattoir must be managed in accordance with a prescribed hygiene management and evaluation system.
- No dead animal or animal suffering from a condition that may render the meat unsafe for human and animal consumption may be presented at an abattoir for slaughter.
- Any person entering an abattoir must adhere to the prescribed hygiene requirements.

- Meat should be protected by the best available method against contamination or spoilage by poisons, offensive gasses, vapours, odours, smoke, soot deposits, dust, moisture, insects, or other vectors or by other physical, chemical, or biological contamination or pollution.
- The proponent must ensure enhancement of meat safety practices by conducting of surveys, training in aspects of meat safety and safety of animal products and investigations into food-borne diseases.
- Install foot bath with disinfectant at all the entrances of the slaughtering facility.
- Seek advice of a trained pig diagnostician when it apparent that the disease is present in the drove or litter.
- Use a sound vaccination programme.

## **6. IMPACT ON GROUNDWATER QUANTITY**

Over-abstraction of groundwater could lead to reduced water quantities and a lowered groundwater level that could impact on water access for the abattoir and other users/the neighbouring community. Groundwater abstraction rates and levels should be monitored and managed to avoid over abstraction.

### **MITIGATION MEASURES:**

- Water saving methods should be developed and implemented as far as practicable.
- The proponent should adhere to the conditions of any licence or permit required.
- Groundwater abstractions rates and cumulative volumes must be recorded monthly.
- Resting water levels of the pumped boreholes must be recorded once in every three months. •
- Water shall be used efficiently, and wastage shall be avoided.
- All associated infrastructure such as pipes and taps should be inspected for leakages and repaired to limit water loss.

## **7. OCCUPATIONAL HEALTH, SAFETY AND SECURITY**

Abattoir works are usually exposed to physical and biological hazards at work. The physical hazards includes cuts, needle stick injuries, back injuries, wound, accidents, noise, exposure to polluted air and slippery surfaces.

Generally, project attract people from different locations and backgrounds. Some anti-social behaviour such alcohol and drug abuse may be practised. The presence of construction equipment and all associated tools may encourage theft.

## **MITIGATION MEASURES:**

- Comply with all Health and Safety standards specified in the Labour Act.
- Train workers how to use the equipment adequately.
- Training on occupational health and safety.
- Safety talks to be done every day before the commencement of work.
- Emergency response plans.
- Safety officer to be stationed at the site.
- Formulation of a safety health and environment workers committee.
- A fully stocked first aid kit should permanently be available on site and an adequately trained staff member in a position to administer first aid.
- All workers should have access to the appropriate Personal Protective Equipment (helmets, gloves, respirators, work suits, earplugs, safety goggles, and safety shoes where applicable).
- Proper ablution facility should be used and clearly marked for males and females.
- Use of dust suppression measures during construction phase.
- Reduce noise exposure by isolating noisy equipment and rotate tasks.
- Ensure that all personnel are properly trained depending on the nature of their work.
- Clearly demarcate dangerous areas and no-go areas on site.
- Staff and visitors to the site must be fully aware of all health and safety measures and emergency procedures.
- The proponent must comply with all applicable occupational health and safety requirements.
- Relevant safety signs should be clearly displayed on site.

## **7. GENERATION OF WASTE**

Project activities are usually associated with the generation of waste of all kinds (hazardous and general). During construction phase hazardous waste in the form of oils and lubricants might be produced from construction vehicles and other machinery. Moreover, there will be possibilities of waste to be generated in the form of food leftovers, papers, plastics, and human waste.

Abattoir wastes consist of several pollutants such as animal faeces, bone, fat, animal trimmings, paunch content and urine from operations or areas like lairage, stunning or bleeding, carcass processing and by-product processing. Abattoir wastes can have a detrimental effect on the environment, public health, animal health and economy of the country if they are not effectively managed and controlled. Abattoir's owners often have difficulties in disposing, treating, and processing of these wastes in an environmentally acceptable fashion. If the wastes are not disposed of responsibly, it will result in the pollution of the site and the surrounding environment.

## **MITIGATION MEASURES:**

- Waste disposal systems should be implemented on-site for both hazardous and general waste.
- Regular inspection of the site.
- Use an oil tray to contain the spillage of vehicle and machinery.
- Spills and leaks must be reported and cleaned without delay.
- Place bins around the site.
- Contaminated wastes in the form of soil, litter and other material must be disposed of at an appropriate disposal site at the nearest town.
- Regular inspection of the site.
- Take note that hazardous waste includes litter, mortalities, ash, empty hazardous chemical substance containers, soil and material (e.g., cloths) contaminated by hazardous chemical substances, etc.
- The waste management plan should consider the type of waste, description, source, storage, disposal method, disposal facility and responsible person. The implementation of the waste management plan should ensure:
  - Install sufficient waste bins, skips or bulk containers, where necessary.
  - All containers (bins, skips or bulk containers) shall be kept in a clean and hygienic manner.
  - General and hazardous waste should always be stored and disposed of separately.
  - General and hazardous waste should be disposed of in appropriately demarcated bins.
- Maintain good housekeeping.

## **8. RISK OF LIVESTOCK THEFT AND POACHING**

Generally, abattoir operations are associated with livestock theft and poaching. Farmers in the surrounding area are potential victims of livestock theft and poaching. Abattoir operators are often tempted to buy stolen livestock or meat since it is sold at a cheaper price by the thieves. The stolen livestock is usually slaughtered at night, and this gives room for cattle rustlers to sell livestock freely.

On numerous occasions, Outjo has been in the news for being a link in the illegal rhino horn, elephant tusk and pangolin trade, thus abattoirs can be viewed as slaughterhouses for such illegal activities and often accused of stock theft and poaching (Oxpeckers Reporters, 2017). However, abattoir operators can also be victims of stock theft.

## **MITIGATION MEASURES:**

- The proponent should refrain from livestock theft at all costs and should be aware of the penalties of stock theft perpetrators.
- Inform the police of any suspicious selling of stock as soon as possible.
- All the stock should be counted regularly and keep a checked register.
- Regular check of stock to ensure that suspected losses are recognised and reported to the police as soon as possible.
- Refrain from buying stock without proper identification and permits.
- Record the daily number of stock slaughters.
- Security surveillance /check point system should be installed to monitor the area.
- Regular briefing on livestock theft.
- The premises must be fenced to prevent animals from entering the farm.
- Implement good bookkeeping.
- There should be a system in place to identify livestock and record changes, including movement to and into the farm.
- Always have a copy of livestock permit kept on farm for inspection purposes.
- All livestock on farm must be identified in accordance with provisions of the stock brands tags.
- Avoid slaughtering at night, to prevent suspicions of stock theft.
- Reframe from buying stolen livestock.
- Poaching should be prohibited.

## **9. NOISE**

Potential noise will be generated from construction equipment and heavy machinery. Excessive noise can be a health risk to site workers and surrounding animals. The noise is expected to be within the immediate area of the project site; hence the employees are the immediate receptor of the noise impacts. According to ISO 18001 standards, workers are not allowed to work under noise levels that are equal to or exceed 85 decibels per 8 hours.

## **MITIGATION MEASURES:**

- Employees should be equipped with ear protection equipment such as earmuffs and plugs.
- Employees should be limited to working hours only at most 8 hours per day.
- Noise pollutions should be addressed and mitigated at an early stage.
- Noise from operations vehicles and equipment on-site should be reduced to acceptable levels.
- Ensure regular maintenance of machinery and equipment.
- Noise levels should be checked regularly.
- Noise levels should not be equal to or exceed 85dBA for workers working an 8-hour shift (according to ISO 18000).

## 10. ARCHAEOLOGICAL IMPACT

During construction phase historical resources protected under the National Heritage (27 of 2004) may be encountered during excavations. The project site is not located at any known or documented archaeological site.

### MITIGATION MEASURES:

- If any archaeological features or objects (e.g., Pottery, bones, shells, ancient clothing or weapons, ancient cutlery, graves, etc) that possess cultural values are found, they should be barricaded off and the Namibian Heritage Council (NHC) office should be informed immediately.
- The site location where archaeological features might be found should be marked with flag tape and the GPS coordinates should be recorded.
- The proponent should adopt the Chance Finds Procedure: “a person who discovers any archaeological object must as soon as practicable report the discovery to the Council”, so that if buried archaeological remains which are not visible to surface survey may be handled in accordance with the provisions of Part V Section 46 of the National Heritage Act (27 of 2004).

## 11. RISK AND SPREAD OF COVID-19

**Coronavirus (COVID-19)** is an infectious disease caused by a newly discovered **coronavirus**. The virus that causes COVID-19 is mainly transmitted through respiratory droplets generated when an infected person coughs, sneezes, or exhales. COVID-19 can be conducted by touching the eyes, nose, or mouth after touching a contaminated surface. The symptoms of this virus are mild to moderate respiratory illness such as fever, dry cough, and tiredness.

### MITIGATION MEASURES:

- Frequent hand washing or disinfection with alcohol-based hand sanitizer.
- Respiratory hygiene such as covering coughs.
- The physical distancing of at least 1 metre or more according to the national recommendations.
- Wearing masks where distancing is not possible.
- Seek medical care when experiencing fever, dry cough, and difficulty breathing.
- Personnel who are unwell or develop the symptoms should stay home, self-isolate and contact medical attention.
- Avoid touching your eyes, nose, or mouth if your hands are not clean
- Avoid close contact with people who have symptoms of coronavirus
- All COVID -19 protocols should be adhered to.

## **12. RISK AND SPREAD OF HIV AND AIDS**

There will be a probability of the spread of HIV/AIDS, and it can spread beyond the project boundary if mitigation measures are not implemented. Workers may be given little time to visit their partners, as a result they may find new partners from the local area. Condoms may also be limited or not provided at the workplace.

### **MITIGATION MEASURES:**

- Allocate time for workers to visit their families.
- Sensitization campaign to the staff on HIV/AIDS and other STDs.
- Free distribution of condoms on site.
- Free counselling to those already affected by the virus.

## **13. CUMULATIVE IMPACTS**

Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these effects, and any resulting environmental degradation, that should be the focus of cumulative impact analysis.

These impacts result from incremental changes caused by past, present or reasonably foreseeable actions together with the project.

- Massive clearing of vegetation can reduce the species abundance of plants in the study area, resulting in reduced photosynthesis process and hence low food production for fauna. It also increases the chances for the cleared portions to be invaded by invasive species that may outcompete the native species for space and food.
- Reduced ground and surface water quality due to contamination and pollution can result into the bioaccumulation and magnification of contamination into the food web and hence resulting in health risks.

### **MITIGATION MEASURES:**

- Cleared vegetation should be compensation by planting more than cleared.
- The protected and endemic species should be re-introduced in the area.
- Off-road driving should not be allowed, and only existing tracks should be used to avoid trampling of organisms of conservation concern.
- No burial of any waste or burning should be done on-site since all waste must be disposed of on approved disposal sites.
- There should be a proper ablution facility.
- Usage of drip trays to prevent spillage of oil and lubricants which can affect the soil and water and groundwater pollution.



- Waste oils and fuels from drip trays on stationery vehicles and machinery should be disposed of as hazardous waste at a licensed facility by an authorized hazardous waste handler.

## **POSITIVE IMPACTS**

### **1. EMPLOYMENT CREATION**

Employment will be created during the lifespan of the project. The types of jobs will range from skilled, semi-skilled and unskilled. This will improve the wealth and livelihood of people.

#### **ENHANCEMENT MEASURES:**

- Employ locals in all casual labour in both phases.
- Gender equality, transparency should be ensured when recruiting.
- In terms of human resources development and capacity building; the contractor is to enforce training programmes that skilled workers should always train workers, when necessary, for them to enhance their performances and to gain more knowledge that they might demonstrate at other levels in the future.

### **2. GENERATION OF REVENUE**

According to the law of Namibia, operating companies are required pay tax to the government. The revenue generated benefit the nation at large given that money generated from tax is diverted to the public by the government.

#### **ENHANCEMENT MEASURE:**

- Continuous payment of taxes due as regulated in the Namibian laws.

### **3. LOCAL DEVELOPMENT AND IMPROVEMENT OF GENERAL WELFARE**

Project investors are believed to bring development to communities where they are operating as a form of enhancing social responsibility. The general welfare of locals should also be improved.

#### **ENHANCEMENT MEASURE:**

- The proponent should be engaged in community development projects.

## 7. ENVIRONMENTAL MONITORING

Environmental monitoring provides a delivery mechanism to address the adverse environmental impacts of a project during its lifespan and to introduce standards of good practice to be adopted. An environmental monitoring plan is important as it provides useful information and helps to assist in detecting the development of any unwanted environmental situation, and thus, provides opportunities for adopting appropriate control measures.

Important parameters that are sensitive include the impact on Air quality (odour), Effluent, Outbreak of animal diseases, Occupational health, safety and security, and generation of waste. The suggested monitoring details are outlined in the following sections.

**Table 3.** Monitoring of sensitive impacts

IMPACT	TYPE OF MONITORING	MONITORING FREQUENCY
<b>Air quality</b>	<ul style="list-style-type: none"> <li>Monitoring the smell of site</li> </ul>	Regularly
<b>Abattoir effluent</b>	<ul style="list-style-type: none"> <li>Site inspections of on leakages</li> </ul>	Daily
<b>Outbreak of animal diseases</b>	<ul style="list-style-type: none"> <li>Monitoring the health conditions of animals</li> </ul>	Regularly
<b>Occupational health, safety, and Security</b>	<ul style="list-style-type: none"> <li>Conducting Hazard and Risk Assessments.</li> <li>Safety procedures evaluation.</li> <li>Health and safety incident monitoring.</li> <li>Safety toolbox talk.</li> <li>Regular supply of appropriate PPE to employees.</li> <li>Inspections of illegal movements on farm</li> <li>Security checks on farm gates</li> </ul>	Daily and when necessitated
<b>Generation of waste</b>	<ul style="list-style-type: none"> <li>Site inspections of oil spills.</li> <li>Site inspection of housekeeping.</li> </ul>	Daily

	<ul style="list-style-type: none"> <li>• Regular collection of waste</li> <li>• Waste disposal compliance</li> </ul>	
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As stipulated in the EMA no.7 of 2007 and its Regulations of 2012, biannual monitoring and evaluation should be conducted by an independent EAP to monitor and evaluate the environmental performance of the project. Target of improvements should be established and monitored.

## 8. DECOMMISSIONING AND SITE CLOSURE

It is necessary to consider the environmental impacts of decommissioning of any development, even though the decommissioning phase of the project is not known yet.

Decommissioning phase is considered as a separate activity which should be dealt with on its own. It would therefore be addressed in another new EIA to be conducted prior to the site closure.

During the decommissioning phase of the project, the following recommendations should be considered:

- The proponent should develop a closure plan to be updated on an annual basis at least 5 years or more prior to envisaged decommissioning.
- The closure plan should outline rehabilitation methods for the site closure.
- The proponent should consider specialist input to provide direction on the closure plan to ensure best practice.
- Various stakeholders should be engaged as early as possible in the closure planning to ensure that their inputs are considered.
- The environmental commissioner should grant a successful rehabilitation for decommissioning to be considered complete.

### Other recommendations are listed below:

- Removing of equipment on site.
- Removal of associated infrastructures.
- Rehabilitation of all areas impacted by the associated infrastructures.
- Planting of vegetation on site.
- Notify staff about the planned decommissioning and provide them with references to pursue work somewhere else.

## **9. CONCLUSION**

The above Environmental Management Plan is considered sufficient for the construction and operations of the abattoir. Proper implementation will help to minimise adverse impacts on the environment and Where impacts occur, immediate action must be taken to reduce the escalation of effects associated with these impacts.

The Environmental Management Plan should be used as an on-site reference document during all phases of the proposed project. Chakula Foods CC and appointed contractors should take all necessary actions to implement the EMP to minimise adverse impacts on the environment. All Contractors and sub-Contractors taking part in the project should be made aware of the content of the EMP and plan their activities accordingly in an environmental sound manner.

Environmental monitoring should be conducted to determine environmental performance of the project. Evaluation of monitoring processes should be reviewed regularly to enhance performance. Parties responsible for the transgression of the EMP should be held responsible any non-compliance and rehabilitation should be enforced.

## 10. REFERENCES

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