12. Environmental Management Plan (EMP)

The process which was followed in compiling the EMP follows the Environmental Management Act 7 of 2007 (and accompanying Environmental Impact Regulations Government Notice (GN) 29 and 30, Government Gazette (GG) 4878, 6/2/2012.

The purpose of this EMP is to formulate mitigation measures that are binding on all contractors involved during the construction, decommissioning and operational phases by the abattoir owners/operators.

The point of departure for this EMP is to take a pro-active route by addressing potential problems BEFORE they occur. This must limit corrective measures required during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases, as required and if necessary. This EMP deals with the following phases as detailed below:

12.1. Planning and design phase

The EMP offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development. Pro-active environmental measures minimise the chance of impacts taking place during any construction or decommissioning phase and operational phase.

12.2. Construction phase

The bulk of the impacts during this phase will have immediate effect (e.g., noise and dust pollution). If the site is monitored on a continual basis during the construction phases, it is possible to identify these impacts as they occur.

These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

8.3. The Operational phase

By taking pro-active measures during the operational phase, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

8.4. The Closure and Rehabilitation phase

By taking pro-active measures during the planned and unplanned closure phase, potential environmental impacts emanating during the closure (includes rehabilitation) phase will be minimized.

12.1. Planning and Design Stage EMP

There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g., this EMP) during the planning and design phase, the necessary corrective action can be taken to further limit potential impacts.

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Approval	• License to operate	• There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g., this EMP) during the planning and design phase, the necessary corrective action can be taken to further limit potential impacts.	Proponent	Once-off
General	• Various	• There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g., this EMP) during the planning and design phase, the necessary corrective action can be taken to further limit potential impacts.	Proponent Contractors HSEO	Once-off
Appointment and Duties of HSEO	• Construction and Operations activities	• The developer/abattoir owner must provide all contractors with a copy of the EMP.	Proponent	Once-off or as required
		• The priority of the HSEO is to maintain the integrity of the development conditions outlined in the EMP	HSEO	Continuous
		• The HSEO must form part of the project management team and attend all relevant project meetings.	HSEO	Continuous
		• All contractors must ensure that their construction crews attend an environmental briefing and training session presented by the HSEO prior to commencing activities on site.	Principal contractor Contractors HSEO	Once off
Monitoring	• Construction and Operations activities	• Monthly HSEO inspections will take place during construction, operations and during rehabilitation to ensure that objectives are being met.	Contractors HSEO	Continuous

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Appointment and Duties of HSEO for Construction	• Construction activities	• The developer/abattoir owner must appoint an HSEO for Construction. This person will be required to monitor the situation with a direct hands-on approach and ensure compliance and co-operation of all personnel. He/she must be fluent in the languages of the employees.	Contractor	Once-off
EMP	• Construction activities	• This EMP must is binding to all contractors and must be included in tender documentation for construction contracts.	Proponent Contractors HSEO	Once-off
Environmental incidents	• Soil, air and water	• All contractors must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves. • Major environmental incidents must be reported to the relevant authorities in accordance with the provisions of the Environmental Management Act 7 of 2007 (and accompanying regulations Government Notice (GN) 29 and 30, Government Gazette (GG) 4878, 6/2/2012;	Contractors HSEO	Continuous
Occupational Health and safety	• Injury of death	• All contractors must ensure that they have received occupational health and safety training. • All contractors are to operate within the construction regulations of the Labour Act 11 of 2007 and the No. 156 Labour Act, 1992: Regulations relating to the health and safety Of Employees at work. • All contractors are to comply with the Labour Act 11 of 2007 and the No. 156 Labour Act, 1992: Regulations relating to the health and safety Of Employees at work	Proponent Contractors HSEO	Continuous
Drainage lines	• Water	• All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction. • There must be no vehicular access to the drainage lines outside the development area.	Proponent Contractors HSEO	Once off

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Erosion sedimentation and flooding	• Soil erosion • Downstream siltation	• If possible, construction activities must be scheduled for the dry winter months to decrease the risk of erosion during heavy thunderstorms. • No construction activities may occur within any drainage lines.	Contractor HSEO	Continuous
Services	• Soil and water	• Any new services system must be designed according to the minimum requirements of Otjiwarongo Municipality and relevant by-laws.	Proponent Contractors HSEO	Design phase
Housekeeping	• Health and safety	• Clean source of drinking water is to be planned and designed for. • Measures must be in place to ensure this water does not become contaminated. • Depending on the volume of water abstracted from the onsite borehole such use will require a water use licence, which must be applied for from the Ministry of Agriculture, Water and Land Reform (MAWLR) – Department of Water Affairs.	Contractors HSEO	Design phase
Handling of waste	• Soil and water	• Strategies are to be devised and implemented to ensure that by-products do not become a nuisance. • Purification, recycling of liquid effluent and alternative use of the effluent must be investigated.	Proponent Contractors HSEO	Design phase, continuous
		• Handling of solid manure is preferred to handling of liquid manure. This ensures that water usage and effluent generation is kept to a minimum.		
		• Concrete slatted concrete flooring is recommended, and in some instances required for effective manure handling and removal.		
		• Management and design of flush tanks on 'manure removal systems' must be mindful of potential impact to the environment and its resources. • Operation of and the condition of the equipment used for manure extraction must be controlled and managed to ensure no contamination of outside resources is possible.		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Disease control	• Health and Safety • Hygiene and sanitation	• The abattoir must have emergency plans to deal with disease outbreaks. • This includes the design and planning for isolation pens and mass disposal areas.	Proponent Contractors HSEO	Once-off
		The design of lay-out of the abattoir must consider: • The proximity of water sources that can be polluted by the flow-off from the unit. • Availability of sufficient water encourages proper cleaning. • Effective methods of manure handling to reduce the risk of disease. • The management and control of potential disease transfer from visiting farmers, sales representatives, and delivery vehicles.	Proponent Contractors HSEO	Design phase, continuous
		• The design must consider which ventilation systems (natural or mechanical) will be best suited to the operation, considering possible air contamination of the animals, manure, and feed.		
		• The control of bacteria must be considered in the design of the unit lay-out for example, the breeding units and grower units must be on different sites.		
		• Staff must be regularly trained in procedures pertaining to containment of disease outbreaks and destruction and disposal of diseased animals, hygiene in the working environment, and the regulations that must be complied with in national health legislation.		
Environmental incidents	• Water contamination	• At least 1 monitoring borehole must be drilled on the downstream slope of the site to monitor potential groundwater contamination. If a suitable available borehole is present for monitoring purposes, drilling will not be required. • Monthly samples must be analysed for levels of Copper, Zinc, Faecal Coliforms, Conductivity, pH, free and saline Ammonia, Nitrates and Nitrites, and Ortho phosphates.		Immediately and thereafter bi-monthly

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Site security	• Theft and unauthorised access	• The security fence must be planned for and erected prior to any other construction activities on the site.	Proponent Contractors	Once-off
Sense of place	• Visual pollution	• The planning of construction activities for the abattoir (construction site) must endeavour to minimise the visual impact on adjacent landowners.		Once-off
		• The construction camp must preferably be positioned where it will not visually impact on adjacent landowners.		Once-off
Planning	• Future expansion	• When planning the premises, careful consideration must be given to the design to allow space for future expansion.		Once-off
Disease control	• Health and Safety • Hygiene and sanitation	• Pits and tanks into which blood is received must be outside the slaughter floor. They may be located beneath the slaughter floor.		Once-off
		• The equipment that comes in direct contact with the meat to be plastic and resin, high quality galvanised steel or rust resistant metal. • Copper, all its alloys, aluminium, cadmium, painted surfaces, enamel, porcelain and lead may not be used (except lead may be used in dairy solder in an amount not exceeding 5 per cent).		Once-off

12.2. Construction Phase EMP

Abattoir activities have the potential to affect the environment in many ways. They can differ widely in terms of their mode of operation and location, and key issues are likely to vary from site to site. Therefore, it is recommended that the user obtain expert advice on detailed technical issues. The issues arising for all environmental receptors will change over time as the project moves from construction through to operation and future modifications to process and facilities. Proponents and site operators should therefore consider the impacts arising from construction, short-term and long-term operation.

Potential impacts are discussed here in broad terms only as their nature and intensity will depend on the physical characteristics of the project and the composition of any polluting materials. This EIA of the proposed abattoir activities have taken these factors into account in assessing potential impacts on the environment.

This is the phase where excavations and earthworks will be done and then engineering services such as water, electricity, sewerage, roads will be installed at Portion 1 of the NIDA Industrial Park, followed by the construction of the abattoir and its supporting facilities.The mitigations measures proposed herein must be implemented and managed continuously during the construction phase.

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
General	• Housekeeping • Cross contamination • Process flow • Land and visual pollution	• Prior to establishment of any construction crew camp(s), the Contractor shall produce a plan showing the positions of all buildings, laydown yards, and other infrastructure for approval by the HSEO.	Proponent HSEO	Once-off
		• On completion of the construction works, the Contractor shall clear away and remove from the site all construction paint, surplus materials, foundations, plumbing and other fixtures, rubbish, and temporary works of every kind. • Areas thus cleared shall be graded and scarified to restore the ground to its original profile as near as practicable before topsoil placement.		Once-off

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
General	• Land pollution • Soil pollution • Compaction of soil by rubble • Air pollution • Injury to workers and the public	• All persons employed by the Contractor, or his subcontractors shall abide by the requirements of the general environmental protection specifications in the EMP. • Any employees of the Contractor or his subcontractors found to be in breach of any of the EMP may be ordered by the HSEO to leave the site forthwith. The order may be given orally and then in writing. • Confirmation of an oral order will be given as soon as practicable but lack of confirmation in writing shall not be a cause for the offender to remain on site. • No extension of time will be granted for any delay or impediment to the Contractor brought about by a person ordered to leave the site.	Contractor HSEO	Once-off
		• Rubble must be removed from the construction, decommissioning and rehabilitation sites frequently and disposed of at a licensed landfill site.	Proponent Contractors HSEO	Once-off
		• All process areas must possess drain outlets. Humps must be constructed at all doorways to prevent the escape of effluent to stormwater drains.	Proponent	Once-off
	• Quality Control	• Abattoir grading systems must be enforced, or alternatively, abattoirs must be designed for their proposed grading +50% of capacity.	Proponent Meat Board of Namibia	Once-off
	• Soil pollution	• All transformers must be bunded. • Waste refrigeration oil must be disposed of through reputable waste contractors and the legal handling thereof must be verified.	Proponent Contractor	Once-off, Continuous

Aspects and hazards	Impacts	Mitigation/Management Action measures (objectives and targets)	Responsible Party	Frequency
Aesthetics	• Land pollution	• The site shall be kept visually and aesthetically pleasing, especially in and around the Contractor camp. • The HSEO shall regularly inspect the site to ensure that it is neat and clean. • Where required the Contractor camp shall be screened by the Contractor to ensure that there is no unacceptable visual intrusion in the area of the site. • Screening can be done by use of shade cloth or corrugated fencing.	Principal contractor Contractors HSE Officers	Daily
Archaeology and heritage	• Destruction of Archaeological sites.	• If any artifact on site is uncovered, work in the immediate vicinity shall be stopped immediately. • Should any archaeological sites be uncovered during construction, their existence shall be reported to the National Heritage Council immediately. • The position of any known sites shall be shown on the final design plans. • Such areas shall be marked as no go areas. • Artifacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. • The permit shall be obtained from the National Heritage Council by a reputed Archaeologist.	Principal contractor Contractors HSE Officers	As required
Site Establishment and sanitation	• Soil pollution • Water pollution	• Site establishment shall take place in an orderly manner and all required amenities shall be installed at Camp sites before the main workforce move onto site.	Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily

		• The Construction camp shall have the necessary ablution facilities with chemical toilets at commencement of construction activities. • The Contractor shall inform all site staff to make use of supplied ablution facilities and under no circumstances shall indiscriminate sanitary activities be allowed other than in supplied facilities. • Ablution facilities shall be within 100m from workplaces but not closer than 50m from any natural water bodies. • There should be enough toilets available to accommodate the workforce (minimum requirement 1: 20 workers). • Toilets shall be serviced regularly • The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at the Otjiwarongo Municipal dump site • The disposal of waste shall be in accordance with all relevant legislation. • Under no circumstances may solid waste be burnt on site.		
Fauna and Flora	• Intentional or unintentional killing of fauna on site. • Unnecessary removal of flora.	• The areas to be developed are inhibited by open grasslands interspersed with scattered trees and shrubs. These woodlands consists of acacia species such as Acacia mellifera (blackthorn), Acacia erioloba (camel thorn) and, along with other tree species like Terminalia sericea (silver terminalia) and Combretum spp. • Species of fauna found in the areas to be developed are lizards, snakes and birds. No big or	Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily

		small game are encountered with the premises of the NIDA Industrial park. • Special care should be taken not to damage or remove any such species unless absolutely necessary. • Permits for removal must be obtained should such species be affected such as nesting birds. • All shrubs and bush not interfering with the operation of the developments shall be left undisturbed, clearly marked and indicated on the site plan. • The contractor must ensure that no faunal species are disturbed, trapped or killed during the construction phase. • The Contractor and their employees shall not bring any domesticated animals onto the site. • The Contractor shall ensure that the work site be kept clean, tidy and free of rubbish that would attract animals and vermin.		
Occupational Health and Safety	• Health and Safety of employees on site	• The construction phase is expected to present the most challenges from a health and safety point of view. • A clear operating plan should be in place to guide the health and safety requirements during the construction phase. • This plan should guide construction staff in terms of their responsibilities in terms of health and safety during the construction phase. • It should be ensured that construction activities are conducted in such a manner that it does not increase the risk of injury or fatalities of construction staff and that the appropriate	Contractors HSE Officers	Once-off and as necessary. Monitor daily

		measures are in place to prevent any incidents and accidents		
Clearing and Grubbing	• Topsoil • Flora	• The extent of all construction site footprints will be minimised and limited to existing and / or already disturbed areas wherever possible. • The areas needing to be cleared and the degree of clearing required will be determined and demarcated in consultation with the HSEO before clearing begins. • The Contractor shall at all times carefully consider what machinery is appropriate to the task while minimising the extent of environmental damage. • Topsoil shall be cleared of woody vegetation, and specifically exotic vegetation, before ripping and removing. • The topsoil is regarded as the top 300 mm of the soil profile • Topsoil is to be handled twice only – once during clearing and stockpiling & once during rehabilitation • Soil stockpiles shall not be higher than 2.5m or stored for a period longer than one year. • The slopes of soil stockpiles shall not be steeper than 1 vertical to 2.5 horizontal. • No vehicles shall be allowed access onto the stockpiles after they have been placed. • Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation. • The Contractor shall apply soil conservation measures to the stockpiles to prevent erosion. This can include the use of erosion control fabric.	Principal contractor Contractors HSE Officers	Once-off

		• If at any stage of the clearing operations archaeological artefacts are unearthed or identified, the National Hertiage Council must be contacted immediately to conduct a thorough scientific investigation of the finds.		
Prevention of disease	• Health of workers	• The Contractor shall take all the necessary precautions against the spreading of disease such as Covid-19, flu, TB, etc. • All employees that come onsite must obey health and safety protocols and measures must be put in place. • This can then be used as evidence in court should any claims be instituted against the proponent and or their Contractors. • The workforce shall also be sensitised to the effects of sexually transmitted diseases, especially HIV/AIDS. • General health issues shall be brought under the attention of the site staff and condoms shall be supplied on site.	Contractors HSE Officers	Once-off and as necessary. Monitor daily
Site Buildings / Construction Camp	• Visual pollution • Aesthetics • Injury to workers and damage to property	• The planning and design for the Construction Camp must ensure that there is minimal impact on the environment. • The Construction Camp will be placed within an existing disturbed area as far as possible. • The Construction Camp site will be identified by the Contractor in consultation with the HSEO, and negotiated by the Site Manager with the NIDA Industrial Park Manager • All site buildings to be of a container or prefabricated type. No permanent structures will be permitted.	Principal contractor Contractors HSE Officers	Once-off

		• With the decommissioning of the structures all compacted platforms and slab foundations must be ripped and removed. • All buildings will be soundly built and will not pose a danger to personnel. • No fires are allowed outside the Construction Camp. • Adequate and well maintained fire fighting equipment according to the fire hazard strategies must be maintained on site during the construction period (at least two all purpose 12.5 kg extinguishers). • Welding, gas cutting or cutting of metal will only be permitted in a protected area inside the Construction Camp. • The Contractor shall be liable for any costs related to extinguishing fires started by the Contractor's representatives / employees. • Additional penalties for infringements will also be imposed by the HSEO or Site Manager.		
Storm water management	• Hydrology and Storm water • Downstream siltation • Erosion	• It is expected that storm water will be adequately managed during the construction phase. • Storm water will either be directed to the storm water drains or allowed to be absorbed into the soil through the assistance of the gravel distributed especially on the soil surface of the area where infrastructure is located.	Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily
Natural Drainages	• Blocking and diversion of natural Watercourses • Downstream siltation • Erosion	• Under no circumstances shall the contractor interfere with any watercourses in the vicinity of the site.	Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily

		• Should deviation of such watercourses be required as part of the contract design specification, the specifications shall be adhered to strictly. • The HSEO shall ensure that all watercourses are adequately protected to prevent downstream siltation due to erosion on site • Rubble from the construction process shall be removed from site and may under no circumstances be dumped into any natural drainage channels. • The normal flow of runoff water must not be impeded, as this will enhance erosion		
Groundwater	• Groundwater pollution	• No impacts are expected on the groundwater of the area during the construction phase due to the nature of activities. • Containment of waste water will be put in place and to prevent runoff	Contractors HSE Officers	Once-off and as necessary. Monitor daily
Access roads to the site	• Impacts on traffic movement • Nuisance traffic • Congestion	• Planning of access routes to the site for construction purposes shall be done in conjunction between the Proponents, Contractors and the Municipality of Otjiwarongo. • During construction, use should be made of existing access routes to construction areas where possible. • Construct approved vehicle turning areas, avoiding selected ecological sensitive areas or species, and have turning area routes approved by the HSEO. • All agreements reached should be documented and no verbal agreements should be made. • Continual use of dirt access roads by heavy machinery and increased transport loads means they will have to be carefully monitored and	Proponent Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily

		regularly graded as soon as potholes or rutting occurs. • The Contractor shall properly mark all access roads. • Roads not to be used shall be marked with a "NO ENTRY " sign • Temporary access roads must be rehabilitated after usage		
Initial Earthworks and Platforms	• Erosion • Soil pollution	• The construction platform for the Contractor's camp, as well as the platform for the materials storage area must be appropriately planned. • The Contractor shall take appropriate and active measures to prevent erosion resulting from his own works, operations and activities as well as stormwater control measures to the satisfaction of the HSEO or Site Manager. • Restoration costs will be for the contractor's account, should these measures not be reasonably implemented.	Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily
Excavations, backfilling and trenching	• Dust liberation • Injuries and fatalities • Damage to mobile equipment • Natural resource depletion	• Where at all possible, excavations must not stand open longer than 2 days, and should preferably be opened and closed on the same day. • They should not be permitted to stand open longer than a week under any circumstances. Excavations must be marked with tape to clearly demarcate the area and warn against access. • Excavations must not be undertaken until such time that all required materials / services etc. are available on-site, to facilitate immediate laying of such services or the construction of subsurface infrastructure. • Any such excavations should ideally be undertaken within the confines of an established construction site - i.e. a site that is either protected with a	Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily

		peripheral fence, or a site that has a regular / continual human presence. Failing this, regular daily inspections are essential. • Removed soil is to be used to backfill areas where required (i.e. such as existing and unrehabilitated gravel pits). • Excavated material is to be stockpiled along the trench within the working servitude, unless otherwise authorised. • Deficiency of backfill material will not be made up by excavation within the protected area. • Where backfill material is deficient, it must be made up by importation from an approved borrow pit area. • Excess sand and soil resulting from levelling activities of the work area should be stored in low heaps either on the access road or already disturbed area. • Excess topsoil is to be spread evenly over the area in a manner that blends in with the natural topography. • Once heavy machinery has cleared the bulk of these material stockpiles, the disturbed areas should be levelled and cleared of any foreign material.		
Sand mining	• Resource depletion • Visual pollution	• No sand mining will be allowed within the perimeter of the NIDA Industrial Park or surrounding area. • All sand required for construction activities must be procured from offsite licensed companies in around Otjiwarongo.	HSE Officer	Once-off

Vehicle Parking Area	• Congestion • Soil pollution	• All vehicles and plant will be allocated a dedicated parking area in the camp site. • No storage of plant and vehicles will be allowed outside of the designated area.	Contractors HSE Officers	Once-off and as necessary. Monitor daily
Construction Rubble Disposal	• Land pollution • Soil pollution • Compaction of soil by rubble • Air pollution • Injury to workers and the public	• The Contractor shall dispose of all excess material on site in an appropriate manner and then removal to the Municipal dumpsite • All packaging material shall be removed from site and disposed off and not burned on site. • No material shall be left on site that may harm man or animals. • Broken, damaged and unused spares such as glass, nuts, bolts and washers shall be picked up and removed from site. • Surplus concrete may not be dumped indiscriminately on site, but shall be disposed of in designated areas as agreed with the Municipality of Otjiwarongo • Concrete trucks shall not be washed on site after depositing concrete into foundations. • Any spilled concrete shall be cleaned up immediately.	Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily
Stockpiling, handling and storage of building materials	• Land pollution • Visual pollution • Soil pollution	• Stockpiles and storage yards will be demarcated in areas already disturbed or where they will cause minimal disturbance. • Clearly indicate which activities are to take place in which areas within the site e.g. the mixing of cement, stockpiling of materials etc. Limit these activities to single sites only. • This may not always be possible for example for heaps of topsoil, but should definitely be the case for other building materials.	Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily

		• Stockpiles of expensive materials such as cement bags should be such that they can easily be removed from the site over weekends or during rainy weather. • Specific sites should be allocated for construction waste e.g. empty cement bags, discarded planks, etc. • A low temporary fence may be erected around such a site in order to contain the waste and assist the effective removal thereof from the site. • Used cement bags will be placed in wind and spill proof containers as soon as they are empty. The Contractor will not allow closed, open or empty bags to lie around the site. • The Contractor will ensure that all operations that involve the use of cement and concrete are carefully contolled • Concrete mixing may only take place in the construction camp or in agreed specific areas on site. • Concrete may not be mixed directly on the ground. No mixed concrete may be deposited directly onto the ground prior to placing. A board or other suitable platform / surface is to be provided onto which the mixed concrete can be deposited whilst it waits placing • All visible remains of excess concrete will be deposited in a designated area awaiting removal to the Municipal dumpsite.		
Service Area / Wash Bay and storage aras	• Impact on soil	• All vehicle and plant shall be well maintained to ensure that there are no oil or fuel leakages. • All maintenance and repair work will be carried out at the main construction camp within an area	Principal contractor Contractors HSE Officers	Once-off and as necessary. Monitor daily

		designated for this purpose, equipped with necessary pollution containment measures. • Drip trays will be utilised during servicing • The Contractor may only change oil or lubricant at agreed and designated locations, except if there is a breakdown or emergency repair, and then any accidental spillages must be cleaned up / removed immediately. • Drainage from the service area will be channelled into a sump or oil-skimming tank, where it shall be treated to remove old hydrocarbons. • Drainage from the wash bay platform will firstly be channelled into a skimming tank before being released by drain to a sedimentation pond. • Soil contaminated by oil, fuel or chemicals shall be removed, transported and disposed of at a registered Hazardous Waste Disposal Site in Walvisbay or rehabilitated in-situ. • The Contractor shall educate workers on the appropriate methods for workshop maintenance and fuel points to prevent fuel and oil being washed out of containment areas. • Toxins and oil must be recovered from the system at least once a week, and if necessitated more regularly should the HSEO require it. • Toxins and oil recovered must be stored in sealed drums on a covered, bunded area and removed from site either for recycling or disposal at the Walvisbay Hazardous Waste Disposal Site. • All spillage of oil onto concrete surfaces shall be controlled by the use of an accepted absorbent material or saw dust.		

		• Fuels required during construction must be stored in a central depot at the construction camp. This storage area should be located on a slab and be contained within a bund capable of containing at least the volume of one of the containers. • Temporary fuel storage tanks and transfer areas also need to be located on an impervious surface adequately bunded to contain accidental spills. Appropriate run-off containment measures must be in place.		
Claims for damages	• Theft • Reputational damage • Negative publicity	• The HSEO shall keep a photographic record of any damage to areas outside the demarcated site area. • The date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure the responsible party is held liable. • All claims for compensation emanating from damage should be directed to the HSEO for appraisal. • The Contractor shall be held liable for all unnecessary damage to the environment. • A register shall be kept of all complaints from the community. • All claims shall be handled immediately to ensure timeous rectification / payment by the responsible party.	Contractors HSE Officers	Once-off and as necessary. Monitor daily
Public Safety	• Theft of equipment on site • Injury and fatalities	• Access to the construction site should be strictly controlled by a security company. • Trespassing on private / commercial properties adjoining the site is forbidden	Contractors HSE Officers	Once-off
Dust pollution	• Land pollution	• The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring Communities	Contractors HSE Officers	Once-off and as necessary. Monitor

		• Watering of access roads is recommended, as access roads are normally the greatest cause of dust pollution. • Speed limits can also be installed, especially on private dirt roads leading to the site. • Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor		daily
Air Pollution	• Coughs, wheezing and shortness of breath. • Cardiovascular and respiratory diseases. • Lung cancer. • Strokes. • Exacerbation of asthma.	• Reduce the uneccessry idling of diesel engine exhausts of plant and other vehicles • Wear appropriate PPE, such as the correct type of respiratory protective equipment (RPE) depending on the task. • Reduce exposure to dusts and fibres, such as silica, as well as the fumes and gases emitted by vehicles and machinery explains • Never burn waste materials. • Use low sulphur diesel to power equipment and vehicles • Improve existing equipment by using particulate filters and catalyst converters. • Use water sprays or sprinklers to control some types of dust and stop it spreading. • Use an on-tool extraction to control some types of dust. • Source local materials to avoid the need for them to be transported from far	Contractors HSE Officers	Once-off and as necessary. Monitor daily
Separation Tanks	• Water pollution	• The Contractor shall provide grease and oil separation tanks (if required) at all areas where oil spillage or collection will occur, i.e. workshops, oil storage, vehicle wash areas and fuel points.	Contractors HSE Officers	Once-off and as necessary. Monitor daily

		• The Contractor shall provide a method for oil recovery. • Recovered oil shall be collected in weather-proof drums for recycling or disposed of at a registered Waste Disposal site. These drums will be stored on site only on a covered, bunded area. • The Contractor will test effluent discharged from any oil skimming tanks for conformance with relevant effluent standards if requested to do so by the HSEO when pollution is suspected.		
Littering	• Land pollution • Visual pollution	• Littering by the employees of Contractors shall not be allowed under any circumstances. • The HSEO shall monitor the neatness of the work sites as well as the Contractor campsite	Contractors HSE Officers	Once-off and as necessary. Monitor daily
Solid Waste Managment	• Visual pollution • Attracting scavengers	• An adequate number of 'scavenger proof' refuse bins must be provided at the construction sites and at the construction camps. • These bins must be provided with lids and an external closing mechanism to prevent their contents blowing out and must be scavenger-proof to prevent dogs and other animals that may be attracted to the waste. • The Contractor will ensure that all personnel immediately deposit waste in the waste bins provided. • All refuse and solid waste generated at all work sites will be stored in appropriate scavenger proof containment vessels at the relevant site and removed to the main construction camp, where the waste will be sorted and stored within a fenced waste storage area. • All waste must be transported in an appropriate manner	Contractors HSE Officers	Once-off and as necessary. Monitor daily

		• The Contactor may not dispose of any waste and / or construction debris by burning, or by burying. • Discard all construction waste at the Municipality of Otjiwarongo or registered waste management facility / landfill site, particularly those wastes or products that could impact on surface or groundwater quality by leaching into or coming into contact with water. • The contractor will maintain 'good housekeeping' practises as to ensure that all work sites and construction camp are kept tidy and litter free.		
Liqued Waste Management	• Soil pollution • Land pollution • Health • Erosion	• The Contractor must take reasonable precautions to prevent the pollution of the ground and / or water resources on and adjacent to the site as a result of their activities • The Contractor may discharge 'clean' silt laden water overland and allow this water to filter into the ground. However, he must ensure that he does not cause erosion as a result of any overland discharge • No natural watercourse is to be used for the cleaning of tools or any other apparatus. This includes for purposes of bathing, or the washing of clothes etc • All washing operations will take place off-site at a location where wastewater can be disposed of in an acceptable manner. • Trucks delivering concrete may not be washed on site. • No spills may be hosed down into a storm water drain or sewer, or into the surrounding natural environment.	Contractors HSE Officers	Once-off and as necessary. Monitor daily

		• Adequate ablution facilities are to be provided at each construction site, conveniently located near to work areas to avoid localised pollution from camp sewerage. • All soil contaminated, for example by leaking machines, refuelling spills etc. is to be excavated to the depth of contaminant penetration, placed in 200 litre drums and removed to an appropriate landfill site.		
Hazardous waste and materials	• Soil pollution • Health	• Compliance to local, national and international legislation and management practices with regard to the storage, transport, use and disposal of fuel, chemicals, harmful and hazardous substances and materials will be enforced. • Fuel, chemical, harmful and hazardous waste throughout the site must be stored in appropriate, well maintained containers. • Any accidental chemical / fuel spills to be cleaned up immediately. • Storage of all hazardous material is to be safe, tamper proof and under strict control. • Emergency procedures for dealing with spills or releases of solvents and fuel must be put in place. • The training and education of all personnel on site who will be handling the material about its proper use, handling and disposal must be put in place.	Contractors HSE Officers	Once-off and as necessary. Monitor daily
Noise from unattenuated ventilation fans Noise from boilers and other process plant Noise from animals in open holding pens	• Noise pollution • Local residents experience varying levels of stress, • Sleep disturbance or high blood pressure.	• Use quiet power tools and equipment to manage noise pollution. • Where possible, use modern construction equipment that has been designed specifically to produce less noise.	Contractors HSE Officers	Once-off and as necessary. Monitor daily

	• Workers gradual hearing loss	• The Contractor shall ensure that noise levels remain within acceptable limits. This applies especially after working hours and during the night • Schedule work during sociable hours rather than when residents are likely to be sleeping. For example, between 8h00 Am to 17h00 on weekdays and half days on Saturdays. • Also notify local residents of the working hours and keep them updated on the project. • Put acoustic (movable noise) barriers in place to manage the levels of noise pollution. • Machinery and vehicle silencer units are to be maintained in good working order. • Offending machinery and / or vehicles will be banned from use on site until they have been repaired. • Switch off plant when it's not in use. • Ensure employees wear the correct PPE when required to reduce the risk of hearing loss due to excessive noise.		
Water pollution	• Spread of Infectious diseases, like cholera, typhoid fever and other diseases gastroenteritis, diarrhea, vomiting, skin and kidney problems • Clogging of water filters and contamination of drinking water. • High cost to purify drinking water	• Monitor and improve your management and disposal of site waste. Make sure all waste is correctly dealt with to stop it from spreading. • Keep materials such as sand or cement secure. • Materials must be located where there isn't a risk of them being washed into waterways or drains. • Cover up all drains to prevent waste from ending up in the water. • Keep the roads and footpaths to the sites clean at all times. This will prevent silt and other pollutants from running off into any bodies of water.	Contractors HSE Officers	Once-off and as necessary. Monitor daily

		• Properly collect and treat any wastewater being produced.		
Fire prevention	• Poor maintenance of firebreak might lead to fires spreading	• No open fires shall be allowed on site under any circumstance or started as a result of activities on site. • Gas and liquid fuel may not be stored in the same storage area. • No open fires for heating or cooking will be permitted on site, unless otherwise agreed and then only in designated areas. • The Contractor shall have operational suitable, tested and approved fire-fighting equipment available on site at all times at site offices, kitchen areas, workshop areas, material stores and any other areas.	Contractors HSE Officers	Once-off and as necessary. Monitor daily
Erosion Control	• Dust liberation • Foundations subsidence • Visual pollution	• The Contractor shall protect all areas susceptible to erosion and shall take measures, to the approval of the HSEO. • The Contractor shall not allow erosion to develop on a large scale before effecting repairs and all erosion damage shall be repaired as soon as possible. • Where required, cut-off trenches can be installed to divert substantial runoff • During construction, areas susceptible to erosion must be protected by installing temporary or permanent drainage works and energy dispersion mechanisms and prevent erosion.	Contractors HSE Officers	Once-off and as necessary. Monitor daily
Interaction with Affected Parties	• Relations with next door neighbours • Health and safety of next door neighbours	• The success of any project depends mainly on the good relations with the Municipality of Otjiwarongo and its Communities.	Contractors HSE Officers	Once-off and as necessary. Monitor daily

		• It is therefore required that the HSEO and the Contractor establish good relations with all the affected parties in the immediate vicinity of all construction activities. • All negotiations for any reason shall be between the HSEO, the affected parties and the Contractor. • NO verbal agreements shall be made. All agreements shall be recorded in writing and all parties shall co-sign the documentation. • The affected parties shall always be kept informed about any changes to the construction programme should they be involved. • If the HSEO is not on site the Contractor should keep the affected parties informed. • The contact numbers of the Contractor and the HSEO shall be made available to the affected parties. • This will ensure open channels of communication and prompt response to queries and claims. • All contact with the affected parties shall be courteous at all times. The rights of the affected parties shall be respected at all times		
Infrastructure	• Nuisance to communities • Inconveniencing next door neighbours	• No interruptions other than those negotiated shall be allowed to any essential services. • Damage to infrastructure shall not be tolerated and any damage shall be rectified immediately by the Contractor. • A record of any damage and remedial actions shall be kept on site. • All existing private access roads used for construction purposes, shall be maintained at all times to ensure that the local people have free	Contractors HSE Officers	Once-off and as necessary. Monitor daily

		access to and from their properties. Speed limits shall be enforced in such areas and all drivers shall be sensitized to this effect. • Any possible disruptions to essential services must be kept to a minimum and should be well advertised and communicated to the Municipality of Otjiwarongoand surrounding Communities.		
Traffic impacts	• Injured or fatalities as a result of being struck by moving plant • vehicles or their loads striking people, particularly when reversing • vehicles striking services and obstructions • manufacturers • instructions for safe use being disregarded • inadequate training of drivers and signallers; and • unsafe loading and transportation of materials on vehicles. • Obstruction of adjacent roads • Increased heavy mobile equipment traffic in neighbourhood • lost productivity,	• Drivers of the construction and operational vehicles should be in possession of valid and appropriate driving licenses • Planning and managing vehicle operations on construction sites • Organise construction sites so that vehicles and pedestrians using site routes can move around safely. • The routes need to be suitable for the persons or vehicles using them, in suitable positions and sufficient in number and size • Provision and maintenance of safe workplaces, safe vehicles, safe drivers and safe work practices. • Drivers must not be allowed to operate vehicles and machinery while impaired due to medication, alcohol, drugs and medical conditions. • Selecting and maintaining vehicles; and implementing safe driving and working practices. • Provide car and van parking for the workforce and visitors away from the work area; • Control entry to the work area; and • Plan storage areas so that delivery vehicles do not have to cross the site. • Employers should take steps to make sure that all workers are fit and competent to operate the	Contractors HSE Officers	Once-off and as necessary. Monitor daily

	• added project costs, and • bad public relations with the surrounding communities.	vehicles, machines and attachments they use on site • The need for vehicles to reverse should be avoided where possible as reversing is a major cause of fatal accidents. • Install turning circles so that vehicles can turn without reversing. • Safe loading, hauling and offloading zones must be identified onsite. • Make sure that all drivers and pedestrians know and understand the routes and traffic rules on site. Use standard road signs where appropriate • Provide induction training for drivers, workers and visitors and send instructions out to visitors before their visit. • Install aids for drivers, plant and vehicle marshallers, lighting and pedestrians on site should wear high-visibility clothing		

12.3. Operational Phase EMP

In case the Environmental Commissioner finds that changes to the Project, the Project site or Adverse Impacts of the Project warrant revisions to this EMP, Construction Phase EMP, or Operational Phase EMP, then the Environmental Commissioner may require the proponent to prepare and submit a revised EMP, Construction Phase EMP, or Operational Phase EMP, as the case may be to the MEFT for review and approval.

The requirements for the daily management and execution of the abattoir development are stated in this section to ensure that.

- Work is managed with minimal disturbance and creation of nuisance to surrounding natural and human environment.
- Employees and visitors to the sites do not interfere and negatively impact on the environment and next-door neighbours and the conservation and restoration of this must be prioritised.
- A positive HSE culture must be instilled and always practiced by the proponent, their contractors and employees when working and engaging with the surrounding communities.
- Monitoring will be done through random site inspection.

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Site Management	• Health, Safety and Environment	• The proponent must appoint a designated (competent) person, who will inter alia be responsible for the implementation of the EMP and sound environmental management during the operational phase. • The manager would be a good candidate to fulfil the role of HSE Representative for Operation.	Proponent Operations Manager	Once-off
	• Visual pollution	• A maintenance plan for the development must be developed regarding maintaining buildings and perimeter fencing etc. to ensure that they do not deteriorate and become aesthetically unpleasant.	Proponent Operations Manager	Developed and reviewed whenever. abattoir re-apply for its licences

	• Waste generation and disposal	• Environmental accountability must be included in any purchase contracts, thereby controlling activities to be undertaken.	Proponent Operations Manager	Once-off, monitor bi-annually
	• Legal Compliance • Sanctions and penalties	• Activities on the site must be in line with the current environmental legislation. • To this end, all applicable legislation must be identified and documented with reference to the abattoir's activities and environmental impacts.	Proponent Operations Manager	Once-off and as necessary. Monitor monthly

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Lack of enforcement	• Manpower support	• Employ qualified and competent teams and manpower to implement all the practical environmental conservation measures as proposed in this EMP. • Manage the programme i.e., coordinating with an environmental consultant. • Implement necessary prevention or best practice method in the event of poor environmental quality.	Operations Manager HSEO	Once-off
Positioning of security lights	• Light pollution	• Placement of security lights should be directed to glow in a downward direction to avoid light pollution and glare onto nearby communities and properties. • Perimeter lighting area should also be placed in a downward facing manner and motion activated to prevent glare at night. • No flood lights should be allowed to be installed at the for the purposes of illuminating the sites at night.	Operations Manager	Once-off
Visual impact	• Adjustment of terrestrial habitat	• Morning Take 5 talks to be made routine and all employees must be given and undergo induction. • Always determine the route of activities beforehand and restrict all activities to demarcated areas.	Operations Manager	Daily and where required

Sewerage management	• Attraction of pests • Offensive odours • Visual pollution • Nuisance to neighbours • Community complaints	• Only portable flush toilets equipped with French drains/septic tanks will be erected at the abattoir premises. • No foreign object may be flushed down the toilets to prevent damage and maintain integrity of the sewer system and maintain a healthy environment	Operations Manager	Once-off
Solid waste management	• Environmental pollution • Littering	• Implement waste segregation strategies onsite. • Promote positive waste management practices i.e., reduce, reuse, and recycle, and only the remaining waste must be sent to landfill. • Minimise and eliminate the careless release of waste products into the receiving environment. • Waste removal for offsite disposal such as to the landfill should be through licensed waste removal contractors	Operations Manager	Continuously
Noise generation from abattoir equipment and machinery	• Noise pollution to employees, surrounding area and next-door neighbours	• Near source employees must be provided with appropriate personal protective clothing and equipment such as earplugs and earmuffs where required. • The movement and operation of industrial equipment, meat saws etc will be restricted to daytime operational hours only.	Operations Manager	Continuously
Occupational Health and HIV and AIDS	• Prevalence of HIV might increase due to the developments. • The immigration of mainly single persons to the construction site presents a perfect opportunity for sex workers and for local community members to engage in unsafe,	• HIV/AIDS awareness and prevention, and general hygiene training programmes should be developed and implemented. • The main target group is the staff members, but the public may also be encouraged to attend. • Follow up awareness raising, and education should be conducted at least every six months.	Operations Manager	Continuously

	sex-for-cash sexual relations.			
Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Traffic impacts	• Disruption to traffic flow in the immediate surrounds	• Set up appropriate vehicle movement signage on local roads/intersections surrounding the project site to direct traffic flow in a safe manner. • Whenever feasible, abattoir vehicles should avoid leaving the site at peak traffic periods (07:00 to 08:30 AM, 12:00PM to 14:00PM and (17:30PM to 18:30 PM). • Abattoir vehicles should not be allowed to park off site, except in dedicated parking spaces (off site) as may be agreed upon between the proponent and the local authority. • All necessary reflective and lighting signs should be placed on vehicles to maximize visibility and reduce potential accidents that may have occurred otherwise.	Operations Manager	
Job creation, Skills development and business opportunities	• Positive socio-economic impacts and spinoffs	• Semi-skilled and unskilled jobs should target local community members. • Prioritise local employment and spend in local business were reasonably possible. • Enhance the use of local labour and local skills as far as reasonably possible. • Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.	Operations Manager	Continuously

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Erosion, sedimentation and flooding • Litter	• Erosion, sedimentation, and flooding • Water pollution • Soil pollution	• The stormwater management system must be regularly monitored and maintained (e.g., check for erosion of soil); especially any discharge and damaged areas must be repaired when required. • No substances other than uncontaminated rainwater may be channelled via the stormwater drainage system	Proponent Operations Manager HSEO	Once-off and as necessary. Monitor daily
		• Litter blocking storm water system and ensure that excess sedimentation of the grassed drainage areas is cleared to prevent blockages.	Proponent Operations Manager	Ongoing
		• If soil compaction occurs – rip compacted areas to improve infiltration, reduce runoff and ease of landscaping. • Areas of high traffic use are to be compacted /paved. Other areas are to be grassed.	Proponent Operations Manager	Ongoing
	• Groundwater quality	• Any damages to open liquid manure channels at the holding pens must be repaired immediately. • Ensure that excess sedimentation, build-up of bedding and feed is cleared timeously to avoid overflow.	Operations Manager	Ongoing

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Erosion, sedimentation and flooding • Litter	• Erosion, sedimentation, and flooding • Water pollution • Soil pollution	• The stormwater management system must be regularly monitored and maintained especially any discharge and damaged areas must be repaired when required. • No substances other than uncontaminated rainwater may be channelled via the stormwater drainage system	Proponent Operations Manager HSEO	Once-off and as necessary. Monitor daily
		• Prevent litter blocking storm water system and ensure that excess sedimentation of the grassed drainage areas is cleared to prevent blockages.	Proponent Operations Manager	Ongoing
		• If soil compaction occurs – rip compacted areas to improve infiltration, reduce runoff and ease of landscaping.	Proponent	Ongoing

		• Areas of high traffic use are to be compacted /paved. Other areas are to be grassed.	Operations Manager	
	• Groundwater quality	• Any damages to open liquid manure channels at the holding pens must be repaired immediately. • Ensure that excess sedimentation, build-up of bedding and feed is cleared timeously to avoid overflow.	Operations Manager	Ongoing
Effluent discharge		• The slurry dam wall should be well lined i.e., impermeable. • Inspect slurry dam walls for signs of leakage and repair/maintain as when necessary. • Remove sludge when build-up is approximately half the total volume of the dam.		
		• During decommissioning and reconstruction of the slurry dam, and for a period of 4 months thereafter during operation of the dam, bi-monthly water samples must be analysed as detailed in the 'PLANING PHASE" above, and results submitted to the relevant authorities.		
		• All French drains are to be monitored and maintained so as not to cause soil or groundwater contamination in accordance with Section 21(1) of the Water Act No 54 of 1956 and its requirements in terms of water supplies for drinking water and for wastewater treatment and discharge.		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Water supply, usage, and effluent disposal	• Groundwater contamination • Fresh water depletion/over consumption	• Inspect the site for burst, blocked or leaking water pipes. • Water use management programmes are to be designed and implemented to conserve water.	Operations Manager	Ongoing
		• The abattoir must have an available water supply of at least 900 litres per slaughter unit under pressure and protected against contamination. • The water must be clean, potable, and free of suspended material and substances which could put health at risk. • The water must be subjected to flocculation, filtration, chlorination, or other treatment to ensure that there are no E. Coli organisms present and no more than 100 viable micro-organisms per millilitre are present. • An adequate supply of hot water as stipulated in the Standard and Rules of the Meat Board of Namibia, the Meat Industry Act No 12 of 1981 and the Abattoir Industry Act NO 54 of 1976 section 8: General Regulations RSA Government Notice R.93 of 1977 • The water must also meet any other standards and conditions which the Director: Veterinary Services may lay down	Operations Manager	Daily
		• Minimisation of waste volumes, water conservation and optimum water housekeeping are essential. • A water balance is therefore required to detect water losses. • Water may not be re-circulated without the consent of the Abattoir Manager/Hygiene Officer.	Operations Manager	Daily

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Water supply, usage, and effluent disposal	• Groundwater contamination • Fresh water depletion/over consumption	• Water Abstraction licenses and disposal site permits must make provision for conditions which will force abattoirs to incrementally progress towards predetermined water quality and waste management objectives within specified time frames	MAWF Operations Manager	Ongoing
		• Most abattoirs discharge (after appropriate pre-treatment) to municipal sewers. • Records must be kept for compliance with the municipal by-laws for the effluent transported and discharged at the Municipality of Otjiwarongo Sewerage Treatment and Industrial Effluent Ponds.	Operations Manager Municipality of Otjiwarongo	Daily
		• Drainage of effluent discharging equipment including hand-wash basins, sterilizers and boot washes must not occur across floors in traffic zones	Operations Manager	Daily
		• The management and treatment of wastewater and effluent is a specialised subject and professional advice from consulting engineers is essential.	Operations Manager	When required
		• Water used for general washing must be pressurized. If the cost of pressurising is too high, overhead header tanks to improve water pressure must be used.	Operations Manager	Continuous
		• One system of troughs must be considered, whereby the level is controlled for all troughs through one ballcock regulator on the outside of the lairages. • Subsequent troughs can be gravity fed from the level controlled one. A monitoring system needs to be implemented	Operations Manager	Once-off and continuous
		• All hoses must be fitted with self-closing nozzles to prevent wastage when not in use. Where the hoses are in frequent use, pistol grips must be used, whereas pressure sensitive rubber nozzles must be used in areas on intermittent use. • All flexible hoses used for washing purposes must be in a leak free condition.	Operations Manager	Once-off and continuous

		• Teat-like drinking water dispensers must be used in preference to ballcock regulated drinking troughs in animal lairages. If the teat like-dispensers are impractical, the ballcock regulators must be situated on the outside of the lairages to prevent animals from damaging them.		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Sewage services	• Groundwater contamination	• The sewage system must be inspected for leakages on a regular basis and any leakages must be attended to immediately.	Operations Manager	Ongoing
		• French drain system should go through a septic tank system for biodegrading.		
• Waste management	• Soil pollution • Groundwater contamination • Attraction of vermin • Health and safety • Solid and liquid waste generation	• The abattoir must have the facilities to manage its respective solid and liquid waste streams on the premises. • Should they not have these on-site, contractual agreements with external service providers must be in place to ensure that their wastes can be disposed of in a sustainable manner at an appropriate rendering facility. • Subject to compliance with the licensing requirements of the Nature Conservation Amendment Act 5 of 1996 and the Atmospheric Pollution Prevention Ordinance 11 of 1976, abattoir wastes may be disposed of by the following means: ○ Landfilling ○ Composting ○ Anaerobic digestion ○ Incineration ○ Special methods e.g., vulture stations (to be negotiated with the responsible authority) ○ Rendering	Proponent Operations MEFT MAWF Veterinary Services	Continuously
		• Solids traps consisting of three compartments must be installed in all drains (except closed systems) to collect these waste	Operations Manager	Continuously

		products. The Otjiwarongo Municipality must approve the plans for any drainage installations, including solids traps.		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Waste management	• Soil pollution • Groundwater contamination • Attraction of vermin • Health and safety • Solid and liquid waste generation	• Operation of and the condition of the equipment used for liquid manure extraction (e.g., Honey suckers) must be controlled and managed to ensure no contamination of outside resources is possible. • Regular inspections and maintenance of the relevant equipment must be enforced.	Operations Manager	Weekly, monitor daily
		• Subject to compliance with the Otjiwarongo Municipality's refuse removal by-laws, the local council or an independent company must undertake disposal of all domestic waste. • The Abattoir must audit this to ensure safe disposal.	Operations Manager	Weekly, monitor daily
		• There must be a full examination of process by-products and wastes to identify options for waste minimisation. • All wastes (e.g., solid animal wastes, liquid animal wastes or domestic wastes) must be classified and rated with a view to determining the appropriate disposal methods	Operations Manager	Continuously
		• Litterbins with tight-fitting lids must be placed at strategic points within the abattoir, to be determined during the initial design phase and implemented during the operational phase.	Operations Manager	Continuously
		• Cold water must be used to clean surfaces soiled with blood (except periodic deep cleaning at the end of the day) as the use of hot water causes congealing of the blood, making cleaning more difficult, and results in unnecessary wastage of water.	Operations Manager	Continuously
		• The use of squeegees on offal trays to remove the paunch contents off the trays is strongly recommended. • The use of sloped continuous sliding trays is advocated as it reduces the water needed for final wash-down.	Operations Manager	Continuously

		• The use of square trolley type trays is not recommended, as they require excessive amounts of water for solids removal.		
		Management improvement must include: • Minimisation of waste generation at source (including maximising the recovery of useful materials), • Seriously curbing the practice of washing solids into drains by using solid traps (which transfers waste solids to the liquid medium), and	Operations Manager	Continuously
		• Subject to municipal consent, solid and grease/fat traps must be installed downstream of effluent sources to separate gross solids and fats from all effluents prior to discharge.	Operations Manager	Once-off

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Bovine Spongiform Encephalopathy (BSE)	• Condemned meat • Abattoir shutdown • Reputational damage	• If BSE is detected at a facility, there are only three accepted methods that disinfect the prions that are related to BSE, provided that "Best Practices" are used: ○ Incineration ○ Autoclaving ○ Alkaline Hydrolysis	Operations Manager Veterinary Services	When required
• Atmospheric Pollution	• Nuisance odours • Disturbance of next-door neighbours with foul odours • Attracting vermin and pests	• A minimum buffer distance to the nearest residence or residential area must be at least 500 m downwind of an abattoir and 1000 m for a rendering plant. • This depends on the prevailing winds and may need to be increased, if effective and reliable odour control equipment is not installed.	Operations Manager	Continuously
		• External dustbins must be cleaned at least once a week in a maintenance plan for the abattoir to prevent odours.		
		• All chemical storage areas and chemical-based odour control equipment must be located on impermeable concrete floors with bunding capable of containing 110 percent of any spillage.		Once-off

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Atmospheric Pollution	• Nuisance odours • Disturbance of next-door neighbours with foul odours • Attracting vermin and pests	• Ensure that the garbage (household/general waste) is collected on a regular basis to reduce the presence of vermin and flies and reduce odours.	Operations Manager	Continuously
		• Biofiltration must be instituted wherever possible and where required.		
		• Manure must be removed daily from the holding yards, then washing down using low volume high-pressure sprays. This reduces odours and fly-breeding.		Daily
		• During commissioning, odours produced by anaerobic waste treatment ponds must be reduced by: ○ allowing some grease/fat and manure solids to pass through the primary treatment system, establishing a crust of 100 mm thick on the surface. ○ layering of hay on the surface of the anaerobic pond; and ○ using an artificial cover (such as plastic) that breaks down over time and mixes with the fat on the surface. ○ Effluent treatment plants must be adequately designed, operated, and maintained to minimise emission of odours.		Once-off, continuous
	• Nuisance dust • Health and safety	• Fabric filter type dust collectors must be used for dust control. • Surfaces of saleyards, holding pens, unsealed roads and parking areas must be sealed. • Filtered ventilation hoods must service dusty process operations.		Once-off, daily
		• Warehouses must use good housekeeping to alleviate dust generation. • Dry materials, must be handled in such a manner as not to give rise to dust emissions to the atmosphere.		Continuously

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Noise	• Nuisance and disturbance of the peace • Health and Safety	• Erect noise barriers such as screens around noisy equipment and operations. • All ventilation and extractor fans must be noise efficient or fitted with silencers, and all ducts must be lined with sound-absorbent material. • Limit vehicle movement (especially trucks) to and from the site to normal working hours only. • Fit efficient exhaust mufflers to diesel forklift engines, other noisy vehicles, and air-powered tools. • Locate mechanical equipment on mounts designed to isolate structure-borne vibration and noise. Similarly, locate this infrastructure as far as possible away from sensitive receptors. • Reduce the number of animals in the holding pens	Operations Manager	Once-off
		• All activities on the abattoir must abide by the Noise Control Regulations: Local Authorities Act No 23 of 1992, Nature Conservation Amendment Act 5 of 1996 and the Atmospheric Pollution Prevention Ordinance 11 of 1976	Operations Manager	Continuous
• Storm water management	• Water contamination	• Nothing other than uncontaminated rainwater is allowed to enter the storm water system. • Storm water must be kept away from the contaminated areas and directed to the storm water drainage system.	Operations Manager	Continuous
• Recycling	• Positive reuse of waste products	• Recycle manure nutrients for use in crop and pasture production.	Operations Manager	Continuous
• Occupational Health, Safety and training	• Health and Safety • Labour unrest and strikes	• All relevant aspects of the Labour Act 11 of 2007 No. 156 Labour Act, 1992: Regulations relating to the health and safety Of Employees at work are to be implemented	Operations Manager	Continuous
• Training	• Health and Safety • Working relations • Process efficiency	• The proponent must undertake training of employees to make them aware of the EMP for the abattoir. All staff needs to be advised that if they fail in their duties, they are just as liable to	Operations Manager	Ongoing

		prosecution and penalty as is their employer in terms of several bodies of legislation. • Training programmes must contain common elements such as familiarisation with the company environmental policy and commitment to waste prevention, recycling, and raw materials conservation. • Employees must be encouraged to suggest new ideas.		
• Condemned Material	• Spread of animal borne diseases • Health and safety • Reputational damage • Sanctions and penalties from the Meat Board of Namibia	• The proponent and/or manager is responsible for complying with the legal requirements or conditions relating to the safeguarding and disposal of any carcass, part thereof or any edible product which cannot be passed for human or animal consumption e.g., Abattoir Industry Act NO 54 of 1976 section 8: General Regulations	Operations Manager	Ongoing
• Water supply, usage, and effluent disposal	• Compliance • Water management	• All water intakes, whether from mains supplies or other sources, must be metered and all water intakes must be routinely recorded either manually or automatically. • It is recommended that 3 water meters be used, namely for the main water intake, the lairages and process water. • Management must not be content with merely installing water meters but must ensure that the results are obtained and monitored for each process by regular record keeping.	Operations Manager	Once-off, Continuously
• Waste Management	• Water pollution and contamination • Blocked drainage system	• All lairages must be squeegeed and/or dry swept to remove gross solids prior to washdown. • The sweepings must be collected for disposal and must not be flushed to drain.	Operations Manager	Continuously
		• Bleeding troughs must be provided with a drip tray to prevent excessive amounts of blood from entering the drainage system.		

		• Alternatively, a separate drain must be built under the hoof and head removal area, sloped back to the blood trough, so that excess blood can be recollected in the blood trough. • Pipes from the blood trough must be diverted to a container on the outside of the building and must not be connected to the effluent system. Blood must not be dumped informally. • Plastic trays must not be used as bleeding troughs or blood containers. • Suitable acid resistant materials must be used for bleeding trough construction.		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Waste Management	• Ground water pollution and contamination • Blocked drainage system	• The use of a squeegee on offal trays to remove the paunch contents is strongly recommended. • The use of any sludge (from septic tanks. etc.) by irrigation or any other method of dispersal with the aim of increasing soil fertility or any other aim should not be allowed. • Paunch contents must not be dumped informally	Operations Manager	Ongoing
Effluent Management	• Ground water pollution and contamination • Vermin and pests' generation • Spread of diseases	• All lairages must be squeegeed and/or dry swept to remove gross solids prior to washdown. This reduces the effluent generation. • The use of drain covers must only be considered as a safety measure and must not be used as a "solids trap". • Effluents from the lairages must not be discharged in municipal sewers unless the local municipality grants permission. • If no municipal sewage connections are available, the discharge of such effluents must be to impermeable lined pits subject to authorisation in terms of the Water Act 54 of 1956. • Discharge to the natural environment is unacceptable	Operations Manager Employees	Continuous, once-off
		• Lairages and holding pens must have well drained manure slabs for kraal manure prior to removal except if manure is removed directly into a vehicle.	Operations Manager	Continuously

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Condemned Material	• Animal borne diseases. • Health and Safety • Sanctions and penalties	• All "dead on arrival" and "dead in pen" animals must be disposed of as condemned material in terms of Abattoir Industry Act NO 54 of 1976 section 8: General Regulations RSA Government Notice R.93 of 1977, and Meat Industry (Amendment) Act (No. 21 of 1992) • No carcass or part thereof that has been condemned may be brought into any part of the abattoir containing edible products. • Condemned carcasses, portions thereof or any edible products in an abattoir, which cannot be passed for human or animal consumption, must be: o portioned and placed in a theft proof container which has been clearly marked "CONDEMNED", in letters must not be less than 10 cm high, or conspicuously marked with a stamp bearing the word "CONDEMNED", using green ink. o kept in a holding area or a room or dedicated chiller provided for the purpose, except if removed on a continuous basis; and o removed from the abattoir at the end of the working day or be secured in a dedicated chiller or freezer at an air temperature of not more than minus 2°C	Operations Manager	Continuously
• Effluent Management	• Soil pollution • Groundwater pollution • Hazardous waste generation	• Solid wastes must be prevented from entering the drainage system. All areas must be dry swept/squeegeed prior to wash-down of floors, walls, etc. • Minimising water use reduces the effluent volume requiring handling and disposal. • Fat, meat, hair, and blood from carcass trimming and hide removal must be dry swept, collected, and passed to suitable solids handling and disposal facilities rather than being flushed to drain.	Operations Manager Employees	Continuous, once-off

		• Where no other options exist, discharge of effluent to the municipal sewage works may be tolerated as per the authorisation of the municipality. • If no other option exists but to discharge to the natural environment, such effluent must then be discharged to impermeable lined evaporation or treatment ponds as authorised under the Water Act 54 of 1956 and its Regulations. • The use of a dual outlet system on blood troughs, i.e., one for trough washes effluent and one for blood must be a design criterion.		Continuous, once-off
		• Wastewater may be considered for irrigation but permission from MEFT and MAWF must be sought. • No irrigation must take place during times of high rainfall. • A sampling point on the pipe system must be available for monitoring purposes. • The pipe must be metered.	Operations Manager	Continuously
		• Mesh baskets are not effective as solids and fat traps. Other approved forms of solid and fat traps must replace these. • Grease and solid traps with suitable grease removal facilities must be approved by the municipality and installed upstream of major collection sumps, to minimise the problem of grease removal from large volumes of effluent or plant items.	Proponent Operations Manager	Once-off
Effluent Management	• Soil pollution • Groundwater pollution • Hazardous waste generation • Health and hygiene	• Effluent streams must be separated as far as possible to facilitate treatment, isolation, or disposal.	Operations Manager Employees	Continuous
		• The use of microbes for the bioremediation of all abattoir effluents and solid wastes must be investigated further. • Vermiculture, where possible, must be implemented to decompose and filter abattoir wastes, including paunch contents and blood. • The use of man-made, lined, wetland or vlei systems to treat the effluent must also be investigated.		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Effluent Management	• Soil pollution • Ground water pollution and contamination • Vermin and pests' generation • Spread of diseases • Hazardous waste generation	• Where no other options are available, the use of properly designed septic tanks must be considered to pre-treat the effluent generated as per authorisation of Municipality. • The final flow from the septic tanks must be discharged to a municipal sewer line or septic tank and not to the natural environment	Proponent Operations Manager	Once-off
		• Several affordable physical and chemical treatment processes and systems for the treatment of abattoir waste must be investigated	Operations Manager	Continuously
• Condemned Materials Management	• Hazardous Waste Management • Health and hygiene • Compliance • Animal borne diseases. • Sanctions, penalties, and abattoir closure	• Condemned material must remain under strict control from the time of condemnation until they are disposed of in an acceptable manner. • No person may remove a carcass, part thereof or any edible product that has been detained or condemned from an abattoir, except with the permission of a registered inspector, who is a veterinarian and subject to such conditions as he or she may impose. • Facilities (e.g., separate freezers) must be available in the abattoir for the safekeeping of any carcass, meat, intestines, or animal product that has been condemned by the veterinarian or provisionally detained by a meat inspector.	Operations Manager Veterinarian	Continuously

		• If a carcass, meat, intestines, or animal product in an abattoir has been condemned by the veterinarian it must, be dealt with as follows:
		  ○ by incineration (burnt to ashes).
		  ○ by denaturing, once the condemned material has been cut into strips, by spraying with or immersion in a solution of crude phenolic or cresolic acid, or another suitable disinfectant, and burying at a depth of at least 60 cm.
			Operations Manager
			Veterinarian
				When required

		○ by processing in an approved sterilisation / rendering plant; or ○ by means of any other method that the Director: Veterinary Public Health may authorise.		
• Condemned Materials Management		• No condemned carcass, meat, intestines, or animal product may be left at the end of a working day in any section of an abattoir meant for edible produce.	Veterinarian	When required
		• If the veterinarian condemns an animal or carcass, meat, offal or animal product, he must provide the proponent, on request, with a certificate describing the condemned product and giving the reasons for condemnation.		On request
	• Hazardous Waste Management • Compliance • Animal borne diseases. • Sanctions, penalties, and abattoir closure	• Sufficient theft, leak proof, lockable containers with tight fitting lids, must be provided to keep and transport condemned material and they must be clearly marked "CONDEMNED". • Containers must also be provided to collect and hold inedible material until disposal. Facilities to collect and hold blood prior to disposal must be provided.	Operations Manager	Continuous

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Rough Offal	• Health and hygiene • Quality control	• The following requirements must be followed for the washing of rough offal: ○ Rough offal must be removed from the dressing room to the offal room directly adjacent and connected thereto, after being passed, where paunches and intestines are separated and emptied of its contents. ○ washed with clean running water; and hung on hooks for cooling and drip drying before and during chilling.	Operations Manager	Continuous
		• Stunning, hoisting and bleeding areas must have facilities for collecting and storing of blood in closed containers prior to removal and disposal.	Operations Manager	Continuous
• General Waste Management	• Waste management • Vermin and pests • Health and hygiene	• Refuse containers must be provided for the collection of general refuse at various points on the premises. • Areas where waste or refuse containers are kept prior to removal must be impervious, curbed, and drained and the containers must be enclosed or fitted with tight fitting lids. • Equipment must be provided for the emptying of rumens and intestines and the ruminal and intestinal content must be removed continuously. • The proponent of the abattoir must implement a Hygiene Management Program/System.	Operations Manager	Continuous

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Sterilising plants	• Health and hygiene • Quality Control • Compliance • Sanctions and penalties	• Premises of a sterilisation plant must be controlled to prevent the entry of unauthorised persons, vehicles, and animals; this includes the following areas: • (i) the "dirty" area, consisting of the rooms or places where material is received, stored, or prepared for sterilisation. The loading opening of the sterilisation apparatus must be in the "dirty" area; and • (ii) the clean area, consisting of the rooms or places in which the material can be sterilised and dried, ground or otherwise prepared, packed, stored, or dispatched. • The clean and "dirty" areas must be physically separated by means of a solid wall and there must be no direct access between the two areas.	Operations Manager	Continuous
	• Health and hygiene • Animal borne diseases. • Quality control • Sanctions and penalties	• The clean area of a sterilisation installation must be always kept in a clean and sanitary condition, be roofed, and surrounded with impermeable/tiled walls and must be provided with a continuous, impermeable floor. • No person may keep any animal, dog, or cat on the premises of a sterilisation installation or allow it to stay there. • All possible steps must be taken to keep the premises of a sterilisation installation free from flies, rodents, and other vermin e.g., fly screens on windows/entrances etc.		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Sterilising plants	• Health and hygiene • Quality Control • Compliance • Sanctions and penalties • Communities and socio-economic	• The "dirty" area must meet the following requirements: ○ the entire area must be roofed over and surrounded by walls and must have a continuous floor which drains into the sewage system appropriately. ○ the entrance to any drain must be provided with a grid to prevent the entry of any solids. The drainage systems must also be provided with equipment to prevent the escape of offensive smells. ○ any openings in the abattoir walls, which are on the same level as the floor must be provided with steps so that wastewater and effluent cannot escape from the floor into other areas of the sterilizing facility other than into the drainage system. ○ the finish of the structure of the sterilisation plant must be comparable with that of a modern abattoir. ○ hand-washing facilities in the "dirty" area must be provided with hot and cold running water, soap, disinfectant, and disposable paper towels; and ○ footbaths with disinfectant must be provided at all entrances and exits for the disinfections of boots	Operations Manager	Continuous
		• The floors, walls and equipment of a "dirty" area must be cleaned with hot water and disinfected with a suitable disinfectant every day after the work is completed. • Persons who work in the "dirty" area must: ○ be provided with and must wear distinctive marked overalls and rubber boots. ○ disinfect their hands and boots before leaving the "dirty" area; and ○ remove their dirty protective clothing and boots and wash themselves thoroughly with soap and water before	Operations Manager Employees	Continuous

		leaving the premises. Thus, suitable facilities to enable them to do this must be provided. • No person who works in or enters the "dirty" area may enter the clean area or any section of the abattoir for edible products		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Sterilising plants	• Health and hygiene • Quality Control • Compliance • Sanctions and penalties • Communities and socio-economic	• The premises of a sterilizing plant must be fenced and secured to prevent the entry of unauthorized persons, vehicles, and animals, and must include: ○ unclean areas, comprising the rooms in which material is received, stored, or prepared for sterilizing as well as the entrance to the sterilizing apparatus. ○ clean areas, comprising the rooms in which the sterilized material is dried, milled or otherwise prepared, packed, stored, or dispatched; and ○ A solid wall to separate the unclean and clean areas, and there may be no direct contact between these areas.	Operations Manager	Continuous
• Atmospheric Pollution	• Foul odours • Nuisance • Health and Hygiene • Vermin and pests • Sanctions and penalties • Communities and socio-economic	• The building housing the rendering works must be vented to the atmosphere via a discrete stack to allow retrofitting of odour control equipment. • The stack must be at least 3 m above the building roof ridge, have an efflux velocity not less than 15 m/s, and be fitted with emission sampling provisions.	Operations Manager	Once off
		• The most common odour abatement methods used are condensation and condensate subcooling, followed by incineration of the non-condensable by-products. Alternative odour abatement methods must be investigated e.g. • biofilters, chemical scrubbers, multi-stage acid and alkali scrubbing followed by chlorination and incineration in boilers.	Operations Manager	Once off

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Atmospheric Pollution	• Foul odours • Nuisance • Health and Hygiene • Vermin and pests • Sanctions and penalties • Waste management • Communities and socio-economic	• Odour control equipment must be fitted with monitoring equipment with recorders for the monitoring of key parameters. • Good housekeeping and rapid processing is essential to stop odours developing. • Dropped material or spilt tallow must not be left to develop odours. • Bins for holding raw material and rendering products need to be shrouded or covered, and grinding, processing and conveying equipment must be completely enclosed. • Skin curing areas must be connected to the odour control systems. • Storage bins may need to be designed so that they can be cleaned with high pressure hot and/or cold water at least once a day. • A procedure for monitoring odour as well as investigating and resolving complaints must be implemented. • All processed meats that have become tainted or putrid and not removed for rendering within the day of slaughtering must be stored in enclosed containers and frozen as per the regulation standard until they are removed from the premises. • All boilers, steam raising plant and afterburners must use clean fuels free of heavy metals and toxic wastes. • All conveyors and pipe run for waste animal matter transfer operations must be capable of being dismantled for effective cleaning. • Offal and waste animal matter must be received in a fully enclosed building	Operations Manager	Once off

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Abattoir Condemned Material Transportation	• Foul odours • Nuisance • Health and Hygiene • Vermin and pests • Sanctions and penalties • Waste management • Communities and socio-economic	• A vehicle used to transport condemned material must meet the following requirements: ○ the freight section must be completely covered and be capable of being locked and sealed. ○ the inside lining must be watertight and made of smooth metal. ○ the floor must form a unit with the bottom of the sides and the door must be made in such a way that the leakage of fluids from the freight section is prevented; and ○ the floor must be provided with an outlet pipe at its lowest point, which can be tightly closed with a screw valve. ○ The freight space of a vehicle, which has transported condemned material, must be effectively cleaned, and disinfected at the end of each day's work in a place specially equipped for the purpose.	Operations Manager	Daily
		• The abattoir must transport their waste to a rendering facility for destruction where this is financially feasible. • An emergency plan for accidental spillage in transit must be provided by the abattoir. The "Duty of Care" principle applies.	Operations Manager	Daily
		• All trailers/tankers must be always licensed and kept roadworthy to minimise the risk of spillage while in transit as per the Hazardous Substances Ordinance (No. 14 of 1974) and the Road Traffic and Transport Act 22 of 1999; (as amended by the Road Traffic and Transport Amendment Act 6 of 2008)	Operations Manager	Yearly

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Other Abattoir Waste Transportation	• Foul odours • Nuisance • Health and Hygiene • Vermin and pests • Sanctions and penalties • Waste management • Communities and socio-economic	A vehicle used for the transport of condemned material may not be used for any other purpose, but after cleaning and disinfection the vehicle may be used for the transport of inedible material. A vehicle may only be used for the transport of condemned material if the: • load space is lockable, theft proof and sealable. • internal surface is leaking proof and constructed of durable material; and • floor is provided at its lowest point with a drainpipe capable of being securely closed by a screw valve. The load space of a vehicle used for transporting material to a sterilizing plant must be cleaned and disinfected to the satisfaction of a registered inspector at the end of each delivery under seal/ permit at a place specifically constructed for the purpose.	Operations Manager	Continuously
• Storage Areas	• Health and hygiene • Vermin and pests • Disease management	Separate rooms must be provided for: • Handling and holding of hides, skins, hair, and inedible material prior to removal. • Handling and holding of skin-on heads and feet; and • A room where paunches and intestines are emptied, washed, and kept. • The abattoir must have a facility where livestock transport vehicles can be sanitized after off-loading.	Operations Manager	Continuously

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Hygiene Management Programme and Evaluation System	• Health and Safety • Hygiene and sanitation • Animal borne diseases. • Quality Control • Quality Assurance • Auditing • Communities and socio-economic	• Provide the Chief Executive Officer with a documented Hygiene Management System (HMS) containing detailed information on control measures or programmes required to monitor identified control points, including the methods of monitoring, or checking these control points, for approval. • Provide relevant records of observations, checks, measurements, or results. • Provide sampling programme for laboratory analyses, as well as names of laboratories to do the required analyses. • Provide written accounts of decisions relating to corrective actions when taken; and • Assess the hygiene status of the abattoir by means of the Hygiene Assessment System (HAS) and provide results to the CEO for verification as frequently as he or she may require.	Proponent Operations Manager	Continuously
• Document Management System	• Health and Safety • Hygiene and sanitation • Animal borne diseases. • Quality Control • Quality Assurance • Auditing	The document management system must provide for: - • The retrieval of documents relating to an identified slaughter batch. • The recording of each slaughter batch containing information regarding date of harvesting, mass, quantities, identification, and destination for carcasses as well as cut meat; and • a documented product recall procedure approved by the CEO.	Proponent Operations Manager	Once-off
• Schematic plan of the abattoir	• Health and Safety • Disease Management • Quality Control	A schematic plan of the abattoir must be available and must indicate: • all the different areas on each level. • all the different rooms in each area identified, indicating the process or operation including the capacities or rates of operation that take place in such rooms. • the flow of the product. • ancillary structures on the premises.	Proponent Operations Manager	Once-off

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Schematic plan of the abattoir	• Health and Safety • Disease Management • Quality Control • Auditing	• the required temperature as well as the capacity of each room where temperature is controlled. • the different ablution facilities for workers in clean and dirty areas as well as the personnel entrances to the different areas. • all entrances to rooms, areas, and building; and • boundaries, indicating entrances and exits to and from premises	Proponent Operations Manager	Continuously
• Flow diagram of slaughter process	• Health and Safety • Disease Management • Quality Control • Auditing • Compliance	A flow diagram of the process must be in place and indicate: • all steps involved in the process, including delays during or between steps, from harvesting, receiving of the animals to placing of the product on the market; and • details and technical data including equipment layout and characteristics, sequence of all steps, technical parameters of operations, flow of products, segregation of clean and dirty areas, hygienic environment of the abattoir, personnel routes and hygienic practices, product storage and distribution procedures.	Proponent Operations Manager	Once-off and reviewed periodically when Change Management occurs
• Potential hazards	• Health and Safety • Disease Management • Quality Control • Auditing • Compliance • Communities and socio-economic	The Proponent must prepare a list of all potential biological, chemical, or physical hazards that may occur at each step of the process, including: • unacceptable contamination or recontamination of a biological, chemical, or physical nature. • unacceptable survival or multiplication of pathogenic micro-organisms; and • unacceptable production or persistence of toxins or other undesirable products of microbial metabolism.	Proponent Operations Manager	Continuously
• Prevention of hazards	• Animal borne diseases outbreak. • Health and Safety	The Proponent must prepare written hygiene control programmes to prevent, eliminate or reduce hazards to: • ensure that control programmes for each hazard is implemented. • establish critical limits for control points.	Proponent Operations Manager	Continuously

	• Hygiene and Sanitation
	• Quality Control
	• Quality Assurance
	• Auditing
	• Compliance
	• Communities and socio-economic
		• establish a monitoring or checking system for each control point; and,
		• prepare written corrective actions that must be taken without hesitation when a deviation is observed, and such corrective action must specify,
		  ○ the persons responsible to implement the corrective action.
		  ○ the means and action required for each hazard.
		  ○ the action to be taken about the meat having been processed during the period when the process was out of control; and
		  ○ that written record of measures taken must be kept.		

• Hygiene Control Programmes	• Hygiene and Sanitation
	• Quality Control
	• Quality Assurance
	• Auditing
	• Compliance
	• Communities and socio-economic
		The Proponent of the abattoir must implement an HCP for ante-mortem inspection, including control measures to:
		• ensure that all animals (especially those) which for some reason or other cannot be processed into safe meat are identified and handled humanely and appropriately.
		• identify animals with diseases and conditions of which symptoms may not be visible during post-mortem meat inspections.
		• identify animals with highly contagious diseases or diseases controlled under the Animal Health Act, No 1 of 2011 and its Regulations of 2018.
		• identify animals that pose a high contamination risk, and such as those with septic conditions or those that are excessively soiled; and ensure that injured animals in obvious pain are sent through for emergency slaughter.
		An HCP for slaughter and dressing, including control measures (CM) to ensure that no contamination of meat and edible products occur from,
		  ○ the slaughter surfaces.
		  ○ wind and dust
		  ○ the contents of any hollow organs.
		  ○ persons working with edible products; or
			Proponent Operations Manager	Continuously

		○ contact with unclean objects. • slaughter and dressing procedures which must limit any contamination to the absolute minimum. • training of all workers in correct slaughter techniques including principles of hygiene practices which must be monitored; and • a programme for the daily checking of carcasses for soiling to provide for regular checking of a representative sample of carcasses throughout the day on a random basis and to determine the levels of contamination of carcasses. • an HCP for meat inspection, in terms of which the supervisory registered meat inspector assisted by the registered veterinarian must monitor meat inspection by means of implementation of written control measures to ensure: ○ that meat inspection is done according to the regulations. ○ the competency of the meat inspectors and meat examiners. ○ the personal hygiene of the meat inspectors and meat examiners. ○ that organs are correlated to the carcasses of origin until inspection is done. ○ the security of detained carcasses and organs. ○ the security of provisionally passed carcasses and organs. ○ the security of the stamp of approval. ○ the security of condemned material; and ○ the implementation of standard operational procedures (SOP's) for: ○ emergency slaughter. ○ preferential slaughter. ○ provisional slaughter. ○ dirty animals; and ○ dropped meat.		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Hygiene Control Programmes	• Hygiene and Sanitation • Quality Control • Quality Assurance • Auditing • Compliance • Communities and socio-economic	An HCP for personal hygiene of workers in terms of which: • A general code of conduct, approved by a registered inspector, for personnel and for workers who come into direct contact with meat and edible products, must be available. • a training programme, as well as registers of attendance, for all personnel to apply the principles of the code of conduct must be available; and • records of surveillance and supervision including records of disciplinary action in cases of repetitive misconduct or non-compliance must be available. An HCP for medical fitness of workers in terms of which: • records of initial medical certification that workers are fit to work with meat and edible products, prior to employment, must be available; and • records of daily fitness checks, including corrective actions applied in cases of illness and injury, must be available. • an HCP for sterilizer temperatures and maintenance of sterilizers in terms of which control measures to ensure the continuous availability and accessibility of sterilizers in good working order at temperatures of 82 °C, including registers for daily checks indicating frequency of checks as well as corrective action procedures in cases of non-compliance, must be available. • an HCP for the availability of liquid soap and soap dispensers, toilet paper, and disposable towels, in terms of which control measures to ensure the continuous availability and accessibility of liquid soap and soap dispensers for hand-washing purposes, toilet paper and disposable towels at pre-identified points must be available.	Proponent Operations Manager	Continuously

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Hygiene Control Programmes	• Hygiene and Sanitation • Quality Control • Quality Assurance • Auditing • Compliance • Communities and socio-economic	An HCP for sanitation and continuous cleaning including a cleaning schedule providing: • a list of all the areas to be cleaned. • a list of all the rooms that must be cleaned within every area. • the name of the person responsible for the cleaning of each area, section, or room. • for each room within a particular area, a detailed description of the cleaning of each structure, including: • the frequency of cleaning. • step by step methods of cleaning. • data of the chemicals which are used, such as registration data, safeness, dilutions, application prescriptions. • the correct application of the detergents such as dilution, temperatures, and contact times. • the rinsing off applied chemicals; and • the results to be obtained as an objective of the cleaning programme. • an addendum for each room in which the cleaning of each structure must be described in detail including aspects such as method, frequency, and target results. • for the training of cleaning teams in the execution of these programmes. • for control over the storage of detergents to prevent contamination of edible products. • a detailed description for continuous cleaning on the processing line during processing, which must include: • a list of all the actions in this programme including the cleaning of moving equipment and crates; and • a step-by-step description of each action.	Proponent Operations Manager	Continuously

		• for these programmes to be approved by a registered inspector; and • for laboratory checks as control of affectivity of the cleaning programs to be instituted and documented. An HCP for availability and quality of water in terms of which: • the proponent of the abattoir must account for the source of water supply and the status of such water. • the proponent must be able to demonstrate the water distribution system within the abattoir and provide an updated schematic plan of the water distribution on the premises. • a sampling programme must be followed to ensure that all outlets, including water hoses are checked on a repeated consistent basis within an allotted period, and the sampling procedure must be described; and • the owner is responsible to ensure that water used in the abattoir is potable and that records of microbiological and chemical water test results are available. An HCP for vermin control in terms of which the owner of the abattoir must provide a written control programme for each vermin type , and such programme must include: • schematic drawings indicating the position of bait stations. • a poison register, including specifications for the use of different poisons; and • training programme for persons working with poisons. An HCP for waste disposal, including condemned material, in terms of which: • the proponent of the abattoir must provide a written control programme for the removal of each different category of waste material including general refuse removal; and • security arrangements to prevent condemned material from entering the food chain must be described.		

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
• Hygiene Control Programmes	• Hygiene and Sanitation • Quality Control • Quality Assurance • Auditing • Compliance • Communities and socio-economic	An HCP for in contact wrapping and packing materials in terms of which: • the owner of the abattoir must provide a written control programme addressing the suitability as well as the storage and handling of all in contact wrapping and packing material. • control measures to prevent contamination in storerooms must be provided; and • control measures to prevent contamination of wrapping materials must be provided. An HCP for maintenance, • providing for the proponent of the abattoir to provide a document addressing the routine maintenance of all equipment and structures; and An HCP for thermo control in terms of which: • a map must be provided that indicates the layout of all the chillers, freezers, and processing rooms. • where temperature control of the rooms is required including: - • each temperature-controlled room or area. • the number of the room or area. • the temperature requirement of each room; and • the throughput of each room. • each room must be equipped with a recording thermograph, or equivalent means of monitoring and • recording must be used, that indicates the temperature measurements in the room on a continuous basis. • the graphs or data must provide the actual time and temperature as well as the correct date. • annual calibration and certification to this effect must be available.	Proponent Operations Manager	Continuously

		• records in respect of regular testing of digital thermographs and meters against a certified fluid in glass thermometer, done by the owner, must be available. • placing of the thermo-sensors within rooms must be representative of the temperature in the room. • if a centralized computer system is used for this purpose all the relevant temperatures must be recorded on an ongoing basis at least every 30 minutes. • the temperature status of every room must be checked at least every 12 hours by the owner to ensure maintenance of temperatures and all deviations must be accounted for. • checks by the owner must be recorded on the temperature control records. • any deviations from the required temperature must receive immediate corrective attention. • the hygiene manager must be notified immediately in every case where a temperature breakdown has occurred. • records must be available for inspection by the Meat Board, or any national veterinarian delegated by the Line Ministry. • the hygiene manager must indicate daily control checks by way of signature on the records.		

12.4. Closure and rehabilitation Phase EMP

The operational phase is followed by the closure and rehabilitation phase of a project. This is also a site-specific plan drawn up to ensure that appropriate environmental management practices are put in place during the development and finalisation of the abattoir and to put in place remediation measures of works.

Closure and rehabilitation phase.

- Provide site specific and fit for purpose mitigation measures to finalise construction works, site clean-up, remediation of contaminated sites, waste and construction rubble removal and restoration activities of areas not going to be built-up.
- Reduce and eradicate any long-term liability issues related to the different extensions to the proponent and to NIDA.

The mitigation measures and activities should commence during the construction and operational phase and be finalised at closure and completion of construction activities.

Aspects and hazards	Impacts	Mitigation/Management Action (objectives and targets)	Responsible Party	Frequency
Soil erosion	• Erosion of site	• All topsoil removed during the land servicing and excavations of foundations must be conserved and used in the rehabilitation and close out phase. • No topsoil may be sold. This soil must be kept safe from erosion. • Stockpile area will be covered with gravel during construction operations to prevent erosion. • Gravel will be removed on completion of construction. The topsoil will be used as a defensive wall for the stockpile pad and ramp, to protect the area from prevailing winds and rainwater erosion. • Topsoil and vegetation from the ramp must be used to create a defensive wall along the perimeter of the ramp and stockpile area. The pile should be used as	Contractors HSEO	Continuously

		windbreaks to shield the ramp and stockpile area from the prevailing winds. • Stockpiles should be stabilised by securing with nets or other suitable sheeting material. • The stockpile pad will be re-shaped to remove any steep embankments during the final rehabilitation and closure phase. • After rehabilitation is complete, no topsoil shall be left over		
Rehabilitation of access roads and surrounding site	• Visual pollution	• Any access road or portions thereof, constructed by the proponents shall be removed and or rehabilitated to the satisfaction of the HSEO. Gravel will be removed. • Any gate or fence erected by the proponents which is not required by the landowner, shall be removed and the land restored to the pre-construction state	Contractors HSEO	Once-off
Removal of construction equipment, vehicles, machinery and infrastructure	• Visual pollution • Nuisance Infrastructure	• All construction equipment/vehicles and machinery should be removed immediately from the site at the end of defects liability period. • The removed materials should be transported and kept in safe place for use by the owners and Contractors in other works. • The area should be cleaned and all domestic wastes, debris/waste metals, grease and oils must be cleaned up and disposed of in a manner approved by competent authorities. • There must be a removal of all portable toilets, bins, machinery, and other equipment on site as according to relevant legislation	Principal contractor Contractors HSEO	Once-off
Monitoring	• Visual pollution • Nuisance Infrastructure	• Monthly HSEO inspections will take place during construction and during rehabilitation to ensure that objectives are being met.	Contractors HSEO	Continuously

12.5. Responsibilities of the role players

12.5.1. Developer/abattoir owner

The proponent/abattoir owner has a "duty of care" in terms of Principle 2, Principles of Environmental Management 3 (J) of the Environmental Management Act No 7 of 2007 which states that; a person who causes damage to the environment must pay the costs associated with rehabilitation of damage to the environment and to human health caused by pollution, including costs for measures as are reasonably required to be implemented to prevent further environmental damage and;

Chapter 4 HEALTH, SAFETY AND WELFARE OF EMPLOYEES, PART A RIGHTS AND DUTIES OF EMPLOYERS AND EMPLOYEES Chapter 39 of the of the Labour Act No 11 of 2007 .

This is a generic Duty of Care that is applicable to all forms of environmental impacts and potential impacts and by implication includes the management of waste.

The proponent/abattoir owner remains ultimately responsible for ensuring that the development is implemented according to the requirements of this EMP. Although the proponent appoints specific role players to perform functions on his behalf, he ultimately retains the responsibility. The proponent is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players to efficiently perform their tasks in terms of the EMP.

The proponent is liable for restoring the environment in the event of negligence leading to damage to the environment.The proponent must ensure that the EMP is included in any tender documentation so that contractors who are appointed are bound to the conditions of the EMP.

The proponent must appoint an independent Inspection service provider and/or Health, Safety and Environmental Officer with appropriate background and training during all phases of the development to oversee all the occupational health, safety and environmental aspects.

12.5.2. Contractor

Any contractors, as the proponents agents on site, are bound to the EMP conditions through their contract with the proponent, and is responsible for ensuring that they adheres to all the conditions of the EMP. The contractor must thoroughly familiarise themselves with the EMP requirements before coming onto site and must request clarification on any aspect of these documents, should they be unclear.

The contractor must ensure that they have provided sufficient budget for complying with all EMP conditions at the tender stage. The contractor must comply with all orders (whether verbal or written) given by the HSEO, project manager or site engineer in terms of the EMP.

12.5.3. The abattoir employees

Employees are responsible for ensuring that the EMP is implemented during the operational phase in accordance with the requirements of the EMP. However should they fail, the abattoir owners retain the ultimate responsibility.

12.5.4. Health, Safety and Environmental Officer (HSEO)

The HSEO is appointed by the proponent to enforce compliance and monitor of the implementation of the EMP during any construction and operational phases.

The HSEO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The HSEO must attend relevant project meetings, conduct inspections to assess compliance with the EMP and be responsible for providing feedback on potential health, safety and environmental problems associated with the development. In addition, the HSEO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management; and
- Undertaking routine monitoring and appointing a competent person/institution to be responsible for specialist monitoring, if necessary.

The HSEO has the right to enter the site and undertake monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

(a) Liaison with Authorities

The HSEO must be appointed during the planning and design phase and must form part of the project management team.

The HSEO will be responsible for liasing with the Municipality of Otjiwarongo and MEFT. The HSEO must submit environmental audit reports to the authorities before; during and after construction phases (decommissioning and rehabilitation). Audits need to be submitted thereafter at least quarterly.

These audit reports must contain information on the contractor and proponent's levels of compliance with the EMP.The audit report must also include a description of the general state of the site, with specific reference to sensitive areas and areas of noncompliance.

The HSEO is to suggest corrective action measures to eliminate the occurrence of the non-compliance incidents. In order to keep a record of any impacts, an Environmental Log Sheet must be kept on a continual basis.

(b) Liaison with Contractors

The HSEO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase (decommissioning

and rehabilitation). This would also include informing the contractors of the necessary corrective action to be taken.

12.5.5. Ministry of Enviroment and Tourism (MEFT)-Directorate of Environmental Affairs (DEA)

The MEFT, as a regulatory authority is mandated to oversee the protection of the environment within the boundaries of the Republic of Namibia. As part of this function, MEFT is required to audit the abattoir against the conditions stipulated in the Conditions of Environmental Clearance Certificate and mitigation measures proposed in the EMP.

Auditors will be existing inspectors from MEFT, Meat Board of Namibia and the Ministry of Agriculture Water and Land Reform -Veterinary Services division who are familiar with the operation of abattoirs.

12.6. Implementation of the EMP

All construction activities will be carried out in compliance with the relevant legal requirements. No significant impacts are anticipated for the activities that have been identified and management and mitigation measures are in place for potential risks.

This EMP.

- Has been prepared pursuant to identified aspects and hazards involved in the construction and operation of the Nuverah Prime Investments abattoir. The proponent, their contractors and employees will be required to comply and will be a contractual requirement.

12.6.1. Location of the Environmental Management Plan

The HSEO should ensure that a copy of this EMP is always available on site. This includes any EMP, or other document used to guide the overall management of environmental, health and safety aspects of the entire land servicing and construction developments.

The following are also examples of documents to be kept on site:

- Site Diary
- I & AP Complaints register.
- Environmental incidents register/ Environmental Log Sheet
- Non-conformance Reports.
- Method Statements.
- Material Safety Data Sheets (MSDS).
- Written Corrective Action Instructions.
- Safe disposal certificate for all types of waste disposed of.
- Health, Safety and Environmental Training Records.
- Notification of Emergencies and Incidents.
- Copies of monthly reports
- Minutes of site meeting including discussions on environmental issues

12.6.2. Compliance Assessment

The HSEO should ensure that the requirements contained in this EMP are complied with. Clear records of compliance issues and/or the compliance status with this EMP should be kept for assessment either as part of any environmental audits or performance assessments conducted for the land servicing and construction developments.

Should any issues of non-compliance be identified, these should be rectified immediately, or a clear action plan complied to ensure that the issues are addressed as quickly as possible.

12.6.3. Conclusion

This EMP has a long-term objective to ensure that:

- Environmental management considerations are implemented from the design phase of the project.
- Contractors can and shall include any costs of compliance with this EMP into the tender prices.
- Precautions against environmental damage and claims arising from such damage are taken timeously.
- The completion date of the various contracts is not delayed due to environmental problems with the landowner, communities or Regulatory Authorities arising during the project execution.

This EMP is legally binding because it will form part of the contract between the MEFT, the proponent and any contractor or staff member.

It is crucial for all recommendations made in this EMP to be appropriately implemented on site during construction and operation of the proposed abattoir. Compliance monitoring by an appropriately qualified HSEO will serve as a means of verifying the degree to which the EMP is being implemented on site.