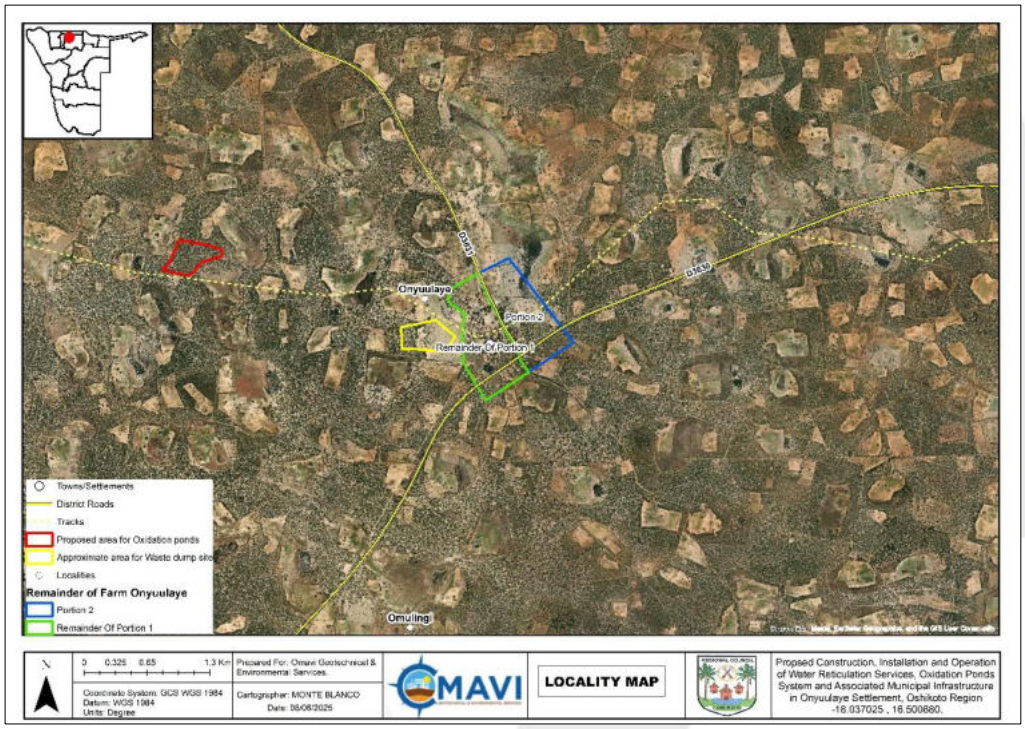
P.O. Box 1642 Windhoek
info@omavi.com.na
+264 81 478 6303
+264 81 214 3721

ENVIRONMENTAL MANAGEMENT PLAN (EMP)



TO

Support NEW APPLICATION for Environmental Clearance Certificate (ECC): The Proposed Development of Municipal Infrastructure in Onyuulaye Settlement, Oshikoto Region

PREPARED BY:	OMAVI Geotechnical & Environmental Services P.O Box 1642, Windhoek Email: info@omavi.com.na Tel: +264 814786303
PREPARED ON BEHALF OF:	Oshikoto Regional Council Private Bag 19247 Omuthiya Namibia
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LIST OF ABBREVIATIONS

DEAF: Department of Environmental Affairs and Forestry

EAP: Environmental Assessment Practitioner

ECC: Environmental Clearance Certificate

ECO: Environmental Control Officer

EHS: Environmental, Health and Safety

EIA: Environmental Impact Assessment

EMA: Environmental Management Act

EMP: Environmental Management Plan

ESA: Environmental and Social Assessment

I&APs: Interested and Affected Parties

MEFT: Ministry of Environment, Forestry, and Tourism

MME: Ministry of Mines and Energy

MAFWLR: Ministry of Agriculture, Fisheries, Water, and Land Reform

NHC: National Heritage Council

OHS: Occupational Health and Safety

ORC: Oshikoto Regional Council

PPE: Personal Protective Equipment

SME: Small and Medium Enterprise

LIST OF ANNEXURES

Annexure 1: Environmental Management and Mitigation Measures for the Proposed Oxidation Ponds in Onyuulaye Settlement

Annexure 2: Environmental Management and Mitigation Measures for the Proposed Solid Waste Dumpsite in Onyuulaye Settlement

Annexure 3: Archaeology Chance Finds Procedure (CFP) Guide

1 INTRODUCTION

This report serves as a guiding document to ensure that the project complies with environmental regulations and minimizes its negative ecological and social impacts. It is typically required as part of the Environmental Impact Assessment (EIA) process as stipulated by the EMA Act of 2007.

1.1 Objectives of the EMP

The primary objective of this report is to ensure that the project is implemented in an environmentally sustainable and socially responsible manner. These objectives align with regulatory requirements and best practices for minimizing the negative environmental impacts.

Key Objectives of the report

Ensure Environmental Compliance: Adhere to national and international environmental regulations, policies, and standards. Secure the necessary environmental permits and approvals before project implementation.

Identify and Mitigate Negative Environmental and Social Impacts: Assess the potential environmental risks associated with the proposed development of municipal infrastructure (e.g., habitat destruction, soil erosion, water usage, waste generation) and propose mitigation measures to reduce negative impacts and enhance positive outcomes.

Promote Sustainable Development: Ensure that the proposed project contributes to local authority development goals while maintaining environmental sustainability, and support local communities by involving them in the project and addressing their concerns and ensuring minimal disruption to their livelihoods.

Establish Monitoring and Management Programs: Establish monitoring programs to track the effectiveness of mitigation measures and provide guidelines for regular environmental audits and reporting requirements.

Enhance Stakeholder Engagement and Public Participation: Ensure that communities, government agencies, and other stakeholders are informed and involved in decision-making and address stakeholder concerns transparently.

Ensure Occupational Health and Safety (OHS) Compliance: Integrate health and safety measures to protect workers during construction, operation, and decommissioning phases.

Guide the Decommissioning and Rehabilitation Process of disturbed site areas (for the construction works and decommissioning of infrastructure such as oxidation ponds and solid waste dumpsite when capacity is reached in future): there is no provide a plan for the proper closure certain infrastructure such as oxidation ponds and sold waste dumpsite at the end of their operational life and ensure site restoration to minimize long-term environmental degradation.

1.2 Assumptions and Limitations of the EMP

This EMP was developed based on the following assumptions and limitations, which must be acknowledged to understand the scope and applicability of the document.

Assumptions of the EMP

Accuracy of baseline data: The report assumes that the environmental baseline data collected (e.g., soil conditions, biodiversity, climate, and hydrology) is accurate and representative of the project area and is based on existing studies, site surveys, and remote sensing data.

Compliance with regulatory requirements: It is assumed that the project will follow all environmental laws, permits, and policies set by national and international authorities because the effectiveness of the EMP depends on strict enforcement by regulators and project developers.

Implementation of mitigation measures: The EMP assumes that all mitigation and management strategies to mitigate potential adverse/negative impacts will be properly implemented as outlined. The project team is expected to allocate resources and personnel to execute these measures effectively.

Stakeholder cooperation: The report assumes that local communities, government agencies, and project stakeholders will cooperate and provide input during implementation and that engagement efforts are assumed to be sufficient to address stakeholder concerns and prevent conflicts.

Technological and operational stability: The EMP assumes that the proposed project and associated infrastructure will operate as expected, with minimal deviations from final design specifications.
It is also assumed that best practices in renewable energy development will be followed.

Uninterrupted project timeline: The EMP is based on an estimated project timeline that assumes no significant delays due to external factors (e.g., legal disputes, financial constraints, or unforeseen environmental conditions).

Limitations of the EMP

Data gaps and uncertainties: Seasonal variations in environmental conditions (e.g., water availability, biodiversity presence) may not be fully captured, and some impacts may only become evident over time, making it difficult to predict long-term effects with certainty.

Changes in legislation and policies: Future modifications in environmental laws or regulations may render parts of the EMP outdated. Compliance requirements could change, requiring updates or additional approvals.

Effectiveness of mitigation measures: While mitigation measures are designed based on best practices, their effectiveness may vary due to site-specific conditions or unforeseen challenges. Adaptive management may be necessary to refine strategies over time.

External environmental and socioeconomic factors: Unpredictable events, such as natural disasters (e.g., floods, wildfires), could affect project implementation and impact mitigation efforts. Economic or political instability may disrupt project execution or limit resources available for EMP implementation.

Limited scope of assessment: The EMP primarily focuses on direct environmental impacts but may not fully assess indirect or cumulative impacts from nearby projects or regional developments. It may not consider long-term ecological succession or changes beyond the project area.

Dependence on stakeholder commitment: The success of the EMP depends on stakeholder engagement and enforcement, which may be influenced by changing priorities or a lack of funding. If stakeholders do not adhere to their assigned responsibilities, the effectiveness of the EMP could be compromised.

1.3 About the Proponent

The Oshikoto Regional Council (hereinafter referred to as the Proponent) was established through the Regional Councils, 1992 (Act No. 22 of 1992), to plan and develop the Region sustainably for the benefit of the residents and inhabitants of the Oshikoto Region and the Namibian people at large. Oshikoto is one of the fourteen regions of Namibia, named after Lake Otjikoto, with the capital Town being Omuthiya.

The process will be undertaken in terms of the gazetted Namibian Government Notice No. 30 Environmental Impact Assessment Regulations (herein referred to as EIA Regulations) of the Environmental Management Act (No 7 of 2007) (herein referred to as the EMA). The EIA process will investigate if there are any potential significant bio-physical and socio-economic impacts associated with the proposed development and related infrastructure and services.

The EIA process would also provide an opportunity for the public and key stakeholders to provide comments and participate in the process. It will also serve the purpose of informing the proponent's decision-making and that of MEFT.

An EMP is one of the most important outputs of the EIA process, as it synthesises all of the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. This EMP details the mitigation and monitoring actions to be implemented during the following phases of this development:

- Planning and Design – the period, before construction, during which preliminary legislative and administrative arrangements, necessary for the preparation of the land, are made and engineering designs for the planned municipal infrastructure are carried out. The preparation of construction tender documents forms part of this phase.
- Construction – the period during which the proponent, having dealt with the necessary legislative and administrative arrangements, appoints a Contractor for the construction of services infrastructure as well as any other construction process(s) within the development areas.
- Operation and Maintenance – the period during which the development will be fully functional, operational, and maintained.

1.4 About the Environmental Assessment Practitioner

OMAVI Geotechnical & Environmental Services was appointed by the Oshikoto Regional Council to undertake the Environmental Assessment (EA) to obtain an Environmental

Clearance Certificate (ECC) for the activity from the Office of the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT). OMAVI Geotechnical & Environmental Services is a specialist environmental consulting entity, with considerable industry experience in environmental compliance and environmental management of exploration and mining projects. Our team of scientists possesses the right set of technical and analytical skills, which collectively ensure that we understand, in an integrated manner, how a set of planned activities would interact with the biophysical, socio-economic, and political landscape within which such activities are envisioned to take place. Additionally, OMAVI is robustly experienced in undertaking state of the environment reporting, Waste Management Planning, Environmental Management Plans (EMPs), public participation, as well as the management and coordination of all aspects of the Environmental Impact Assessment (EIA) value chain. OMAVI has been active in the above fields, and in so doing has made a positive contribution towards environmental protection and sustainable development in Namibia.

At OMAVI, we are grounded in the idea that a balance between development and environmental protection is achievable through proactive and integrated planning whereby projects are designed and executed with sustainability, closure, and rehabilitation goals in mind.

1.5 Project Description

1.5.1 Project locality

The Oshikoto Regional Council (Proponent) intends to develop (construct, install, and operate) municipal infrastructure in Onyuulaye Settlement. The proposed municipal infrastructure development will be carried out in Onyuulaye Settlement and will cover water reticulation services, sewer reticulation services, wastewater treatment (oxidation ponds), electrical Infrastructure, roads, and stormwater, including access road to oxidation ponds, and solid waste management. The oxidation ponds (under Phase 1A of the development) are planned about 2km northwest of the Settlement's Remainder of Farm Onyuulaye Portion 1 boundary - Figure 1-1. Onyuulaye Settlement falls within the Okankolo Constituency, about 40km north of Omuthiya Town in the Oshikoto Region.

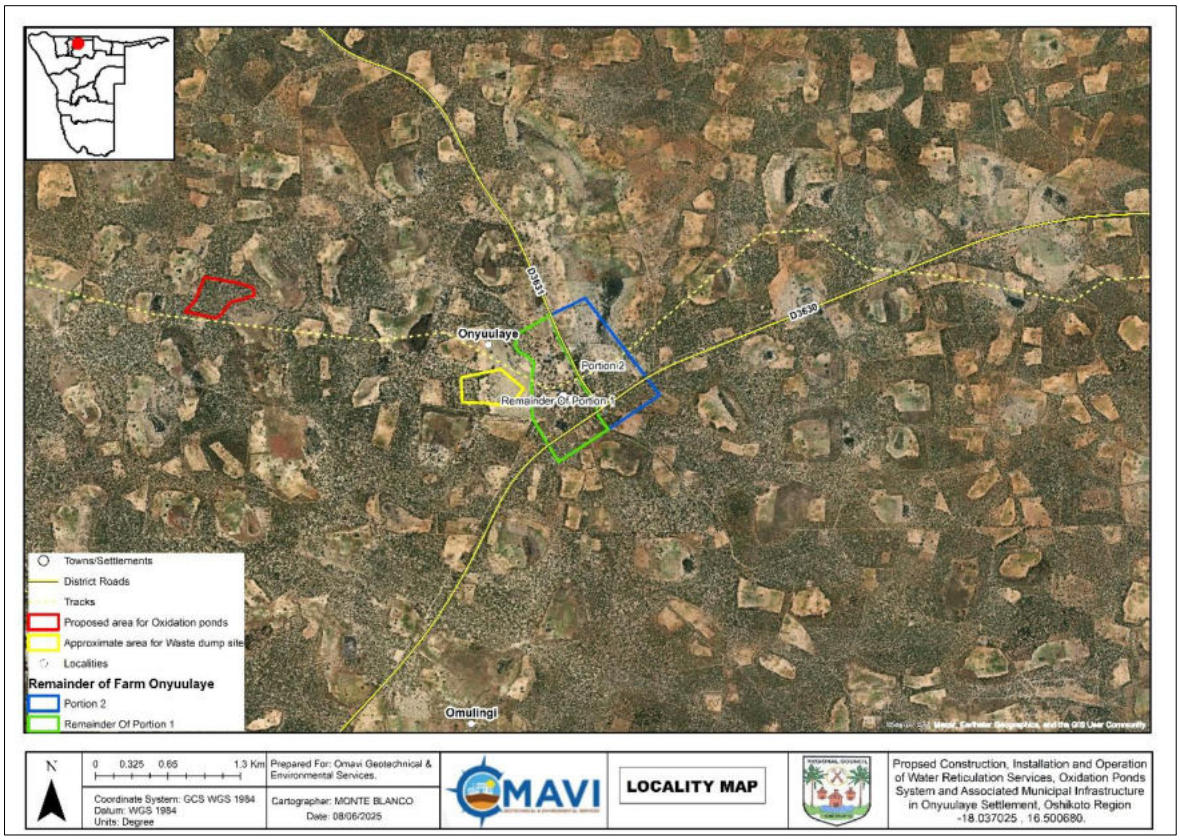

Figure 1-1. The locality map showing the proposed oxidation ponds site, planned solid waste dumpsite, and the Remainder of Portion 1 and Portion 2 of Farm Onyuulaye in Onyuulaye Settlement in the Oshikoto Region

2 LAWS AND POLICIES RELEVANT TO THE EMP

The laws and policies presented in this EMP are those that require permitting and authorization for the project and associated activities. Please refer to Table 2-1.

Table 2-1. Permitting requirements for the proposed project and associated activities

Permit/ Authorizations Required	Governing local law	Required by When	Permitting Body & Contact details
Environmental Clearance Certificate (ECC)	Environmental Management Act 2007 Environmental Impact Assessment (EIA) Regulations (EIAR) (GG No. 4878)	Activities listed in Government Notice (GN) No. 29 of GG No. 4878 require an Environmental Clearance Certificate (ECC). The amendment, transfer or renewal of the ECC (EMA S39-42; EIA Regs 19 & 20).	Mr Timoteus Mufeti: Environmental Commissioner at MEFT Tel: +264 61 284 2701

Permit/ Authorizations Required	Governing local law	Required by When	Permitting Body & Contact details
		Amendments to this EMP will require an amendment of the ECC. The ECC needs to be renewed every 3 years.	
Permits are required for the removal of protected plant species such as the Leadwood, camelthorn, and Mopane trees	Forestry Act (No. 12 of 2001) Nature Conservation Ordinance No. 4 of 1975 (as amended)	Before the removal of any trees of such nature. The Contractor should contact the Forestry Office in Onankali for permits to remove trees.	Contact the MEFT's Forestry Office in Onankali (Oshikoto Region) Mrs. Monika Amutenya: Senior Forester: Forestry Directorate, Oshikoto Region Tel: +264 (0) 65 286 309
License and permit requirements of the applicable water and wastewater legislation	Water Resources Management Act No. 11 of 2013	Before the implementation of the project	Mr Franciskus Witbooi MAFWLR: Water Affairs (Water Law Administration & Policy) Tel: +264 61 208 7226
Discharge of effluent (wastewater) into the environment	Water Resources Management Act (No 11 of 2013) and its 2023 Water Regulations	An effluent/wastewater discharge permit should be applied for from the Department of Water Affairs (Policy and Water Law Administration Division at the Ministry of Agriculture, Fisheries, Water and Land Reform (MAFWLR)).	
Access road permit	Road Traffic and Transport Act 52 of 1999 and its 2001 Regulations	The application of the road access permit to the site, as well as the crossing of overhead lines over any road.	Mr Eugene de Paauw (Roads Authority – Specialist Road Legislation), Tel.: +264 61 284 7027

Permit/ Authorizations Required	Governing local law	Required by When	Permitting Body & Contact details
Storage of fuel tanks onsite from 600 litres and more	Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	A consumer installation certificate should be obtained for a quantity of fuel of 600 litres or more."	Mr Carlo McLeod (Ministry of Industries, Mines and Energy: Acting Director – Petroleum Affairs) Tel.: 061 284 8291
Solid waste management	Draft Pollution Control and Waste Management Bill (September 2003) (not yet enforced)	Establishing a system of waste planning and management (Part 6)	Omuthiya Town Council for permission to dispose of construction solid and general waste at the Town's dumpsite Tel: +264 (0) 65 244 700
Protection of archaeological and cultural heritage sites and or objects as a result of inadvertent unearthing during site preparation and construction	National Heritage Act (No. 27 of 2004)	Discovered heritage resources should be reported to the National Heritage Council.	Mrs. Erica Ndalikokule: Director National Heritage Council: Tel: +264 61 301 903

3 ENVIRONMENTAL MANAGEMENT AND MONITORING ACTIONS

3.1 Environmental Management Actions

Following the findings of the impact assessment carried out in the accompanying environmental impact assessment report, the impact management actions outlined from Table 3-1 are recommended. The specific mitigation measures for the oxidation ponds and solid waste dumpsite are attached hereto as Annexure 1 and Annexure 2, respectively. **It should be noted that the EMP is a living document and can be amended and updated as deemed necessary throughout the project life cycle.**

3.1.1 Mitigation Measures for the Planning and Design Phase

Objective: The municipal infrastructure should be designed for the least environmental and social negative impacts, such as routing, positioning and design of water reticulation services, sewer reticulation services, wastewater treatment (oxidation ponds), electrical Infrastructure, roads, and stormwater, including access road to oxidation ponds, and solid waste management. The 'sense of place' of the site should be maintained as far as possible.

Who is responsible?

- The Planning and Design team, as set up by the Oshikoto Regional Council and possibly with input from consultants, is responsible for all design aspects.
- Specific actions are required to ensure the negative effects or impacts are minimized on-site. The following measures should be implemented.

Table 3-1. Recommended Impact Management Plan Actions for the proposed activities (Planning and design)

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
EMP implementation and training	Lack of EMP awareness and implications thereof	-A project-specific Environmental and Safety Management System (ESMS) Framework document should be compiled -An EMP non-compliance penalty system should be implemented on-site. -At least one ESH officer should be appointed for the construction phase and one for the operational phase to manage the EMP implementation and monitoring. -An external Environmental Control Officer (ECO) should be appointed to audit the EMP implementation and compliance check biannually.	-All required EMP implementation Plans and Systems are compiled and in place. -The ESH Officer/ECO is appointed -The EMP non-compliance penalty system is developed for implementation	-Oshikoto Regional Council -Project Manager	Pre-construction (for the EHS Officer/ECO) Pre-operations for the ECO/ESH Officer)
Authorizations	Lack of Agreements, Permits/ Licenses, and planning documentation	-All the required agreements and licenses, or permits should be applied for and signed, respectively, before commencement of work or as required. -The affected landowner should be timely notified of arrivals to their property, and an open communication system should be implemented. -The permits, agreements referred to herein include:	-Applicable permits and licenses must be obtained from relevant authorities before implementing these activities. -Agreements/permits signed and obtained on time, a minimum of one month (or as per agreements with the	-Oshikoto Regional Council -Project Manager	Pre-construction

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		(a) Land access by the affected land/field owners. (b) Solid waste management disposal permits from the Omuthiya Town Council and waste recycling with local recyclers, as well as hazardous waste permit/consent from the Windhoek Municipality (for the Kupferberg hazardous waste facility) (c) Water supply agreements for domestic use from the NamWater supply line (d) Storage permit from the Petroleum Affairs Division at the Ministry of Mines & Energy for the storage of fuel onsite (600 litres or more). (e) Wastewater disposal permits from the Department of Water Affairs' Division of Policy and Water Law Administration and the MAFWLR.	landowner) before the planned commencement date of construction works.		
Communication between the Oshikoto Regional Council and the landowner, and or local communities	Lack of communication (proper liaison) between the Oshikoto Regional Council and the landowner concerning land use, as well as communities, owing to unmet expectations or project-related nuisances	-Appoint a Community Liaison Officer to liaise with stakeholders and communities for any project grievances or information. -A clear communication procedure/plan, which should include a grievance mechanism, should be developed. -The communities and stakeholders should be kept posted on any changes, progress, or delays in the project activities communicated or agreed upon. -There should be transparency and clear communication on construction progress, delays, and findings thereto.	-The Liaison Officer is appointed -Ongoing Consultation with community members throughout the project, when and as required. -Transparency in communication/progress -Complaint's logbook	-Oshikoto Regional Council	The Liaison officer is appointed or assigned to the community (before project activities) and their responsibilities throughout the project activities

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-The issues or complaints raised by the landowners should be effectively attended to timeously, and resolved amicably.			
Employment	Creation of employment opportunities	-Preference of local people for employment for jobs should be implemented, i.e., permanent residents from Onyuulaye and surrounding areas should be employed for the unskilled labour, preferentially to outsiders, where possible. Employment of people from outside the Onyuulaye area should be justified, for example, by the unavailability of local technical skills. -Prioritize local hiring to enhance community benefits. -Provide on-the-job training and skills development for unskilled workers. -Ensure compliance with fair labour practices and Employment contracts following the Labour Act, 2007. -Promote gender equality and youth employment in hiring processes. -Child and forced labour are strictly prohibited throughout the project phases, and this extends to the subcontracted service providers. -Equal opportunities should be provided for both men and women, when and where possible. -Labourers/workers should be fairly compensated following the national Labour Act on minimum wages for work carried out on site.	-Number of locals employed on the project -People are employed equally and fairly -No forced or child labour -Out-of-area employment to certain personnel is justified (owing to specialized skills that are not locally available) -Percentage of local workers employed. -Number of training sessions conducted for unskilled workers. -Compliance with labour laws and safety standards. -Number of long-term Employment contracts issued.	-Oshikoto Regional Council, in collaboration with the Construction Contractor Human Resources Manager -Project Contractor (Responsible for hiring and compliance). -Human Resources (Facilitates local recruitment and skills training).	Pre-construction and, when necessary, throughout the phase -Pre-Construction Phase: Recruitment planning and local engagement. -Construction Phase: Hiring and skills training for unskilled workers. -Operational Phase: Transition of temporary workers to long-term Employment where applicable.

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Procurement of services and goods	Empowerment of local businesses	-For services related to construction activities such as site establishment, installation, and goods procurement, priority should be given, where possible, to local and regional businesses (including small-medium enterprises (SMEs) for such services and goods. -Procurement of materials and services should be done from registered service providers who can show their relevant authorisations, such as labour and environmental compliance.	-Number of locals trained in relevant skills. -Percentage of procured goods and services sourced from local SMEs. -Compliance with fair procurement policies. -	-Oshikoto Regional Council: Procurement manager (manages supplier selection and compliance). and ensure local procurement policies/SME engagement.	Pre-construction
Land displacement fees and associated fees for socio-economic development	Local socio-economic development	-Commit to the conditions listed in the compensation agreement for displaced properties to make way for the project infrastructure with the affected land/property owner.	-Proof of funds paid to the affected landowner's bank account and related records.	-Oshikoto Regional Council -Construction Contractor	Pre-construction and when necessary, throughout
Water consumption and natural flow dynamics	Over-abstraction and pollution of water and disturbance of natural water flow dynamics	-Establishment of lawns or cultivated gardens on the site must be limited, since it makes use of scarce clean water. If desired, the use of indigenous and locally adapted plants that can survive the natural conditions is preferred. -River drainage systems on and near the site must be maintained, and channels must be kept open to conserve the environment and flow of water. -Water-efficient systems and equipment, which limit the use of water	-Water conservation measures are introduced and implemented onsite -The sanitation facilities are properly designed and erected onsite to prevent water pollution -No drilling of boreholes onsite (for project-related activities) -The water supply agreement is obtained from NamWater.	-Oshikoto Regional Council Planning & Design Engineers -Project Manager	Pre-construction and when necessary, throughout

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		or use recycled water, should be introduced. -All toilets and sanitation facilities should drain into properly designed and adequately sized septic tanks (i.e., using the relevant South African National Standard) and be placed at least 5m from any structure. -There should be no drilling of boreholes on-site nor attempts to abstract water from existing boreholes in Onyuulaye. -A water supply agreement should be made with the MAFWLR Rural Water Supply and NamWater.			
Energy consumption	Overuse of energy resources	-Devices or equipment that conserve energy should be used in the operations of the development. -Safety precautionary measures on how to handle electricity in the facility must be addressed to everyone working on or near the facility, to conform to safety regulations in the workplace.	-Energy-saving measures are implemented onsite	-Oshikoto Regional Council Planning & Design Engineers	Pre-construction and when necessary, throughout
Waste management	Environmental pollution	-Consumables and containers that can be recycled or are biodegradable must be recycled or composted to limit the amount of material going to the landfill. -Hazardous waste should be transported to and disposed of at the Windhoek Kupferberg hazardous waste site. -Concepts like pollution control, material substitution, and maximization of recycling content should be implemented to reduce waste generation and disposal.	-The 3Rs' (reduce, re-use, recycle) are implemented on site to comply with the waste management hierarchy. -The consent to dispose of hazardous waste at the Kupferberg landfill site is obtained from the Windhoek Municipality	-Project Manager -ESH Officer	Pre-construction (for planning and obtaining waste disposal permits/consents) and then throughout the project cycle

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Occupational Health and Safety	Occupational health and safety risks	-Workers should be oriented regarding safety, security, and health procedures on site, and they should be provided with PPE (Personal Protective Equipment). -A health and safety officer should be employed to manage, coordinate, and monitor risks and hazards, and to report all health and safety-related issues in the workplace.	-There is the provision of appropriate and sufficient PPE for all workers -Workers are sufficiently informed and trained on health and safety measures related to their respective work.	-Oshikoto Regional Council -Project Manager -Construction Contractor -ESH Officer	Pre-construction (for obtaining PPE, first aid kits, compiling emergency procedures and protocols, and training) and then throughout the project cycle, as deemed necessary

3.1.2 Mitigation Measures for the Construction Phase

Objective: To construct the PV Plant with minimal disturbance to the surrounding biophysical and social environment.

Who is responsible?

- The Planning and Design team, as set up by the Oshikoto Regional Council and possibly with input from consultants, is responsible for all design aspects.
- Specific actions are required to ensure the negative effects or impacts are minimized on-site. The following measures should be implemented.
- The Construction Contractor must be instructed in writing by the Project Manager to implement the EMP measures. It is then his responsibility to ensure that ALL the measures are implemented, and that responsibilities are appropriately delegated to any subcontractors.
- The Project Manager should inspect the site regularly to ensure that the measures are being implemented and to amend practices appropriately and in consultation with the Contractor, according to the realities on the ground.
- The Project Manager must do sporadic formal inspections as required by the payment schedule. Components of work completed should only be approved by the Project Manager once s/he is satisfied that all EMP conditions have been complied with.
- The EHS Officer should support the Project Manager to fulfil the obligations of the EMP and to monitor the level of compliance with it.

Table 3-2. Recommended Impact Management Plan Actions for the proposed activities (Construction phase)

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
EMP implementation	Lack of EMP awareness and implications thereof	-An EMP non-compliance penalty system should be implemented on-site. -The ESH officer should manage the EMP implementation and monitoring. -An external ECO should commence with auditing the EMP implementation and compliance check biannually from the date of commencement of construction works. -All the site working areas, including access roads, should be inspected daily for the actual implementation of aspects of this EMP. Reports of non-compliance and ineffective measures should be compiled for auditing.	-All required EMP implementation Plans and Systems are compiled and in place for construction -The ESH Officer/ECO is part of the project -The EMP non-compliance penalty system is developed for implementation -Bi-annual Environmental & social monitoring reports are compiled by an external ECO and submitted to MEFT bi-annually	-Oshikoto Regional Council -Project Manager	Pre-construction and throughout the phase, when required, and when the need arises
Site preparation	Impact on areas outside the site boundaries/footprints	-The Contractor should mark out the areas of all the Plant buildings and associated structures before any workers, equipment, or building materials are brought to the site. -The marked-out area should be inspected and approved by the Project Manager. Thereafter, all site	-The site boundaries are marked, and no work is done outside the boundaries	-Oshikoto Regional Council -Project Manager	Pre-construction and throughout the construction phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		personnel should be informed that they may not move or disturb any areas beyond the marked boundaries			
Sourcing of building materials	Sourcing of construction materials from sites that are not environmentally cleared	-Construction sand and other locally-derived building materials should only be procured from sites that have valid environmental clearances. -No materials, including rocks for building purposes, may be collected from the environmentally sensitive areas/	-Construction materials such as sand and gravel are obtained from environmentally certified sites/businesses.	-Oshikoto Regional Council -Project Manager	Pre-construction and procurement of such materials during this phase
Land clearing	Land disturbance during earthwork	-Land clearing should be strictly limited to the necessary minimum. -Clearing should be done, as far as possible, by small equipment, thus avoiding or minimizing the use of heavy earthmoving equipment. Heavy machinery disturbs the soil (which favours the proliferation of weeds afterwards), creates dust, leaves tracks and scars, and is therefore not preferred. -As far as possible, all lay-down areas should be areas that will later be used for other designated	-Limited cleared sites -Less access to tracks -No complaints from the community or land owners regarding land/vegetation clearing outside the agreed project boundaries	-Oshikoto Regional Council -Construction Contractor	Pre-construction and as necessary throughout the project activities

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		purposes, such as parking or driveways. The objective is to make as little disturbance as possible to areas that will not finally be covered by components of the PV plant. -The construction team may only disturb an area up to 2m around each structure site or development area. This 'footprint area' should be demarcated from day 1 (e.g., with metal droppers and hazard tape) so that everyone on-site knows exactly which areas are off-limits. -No damaging or cutting down of vegetation outside the project area footprint, and should not unnecessarily damage or remove any plants within the footprint unless required to do so for the project. -Movement of vehicles and machinery should be restricted to existing roads and tracks to prevent unnecessary damage to vegetation and soil compaction.			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Facilities for workers	Lack of facilities for workers	-All workers must be provided with adequate portable water and toilet facilities while on-site. -There should be sufficient rest areas for the workers on-site.	-Workers are provided with adequate facilities	-Oshikoto Regional Council -Project Manager -Construction Contractor	Throughout the phase
Waste management	Environmental pollution from solid waste.	-All solid waste should be sorted according to type and kept in separate on-site temporary storage containers and disposed of accordingly. Recycling should be optimised. -Strict compliance with the Waste Management Plan will help to reduce the rate of filling of the Omuthiya dumpsite. It will also help to grow recycling capacity in Omuthiya. -Construction wastes should be carefully picked over for the recovery of reusable and recyclable materials. What cannot be reused or recycled should go to the dumpsite. -Food and organic waste should be composted; a local waste contractor who has facilities for transporting and treating organic waste should be identified.	-No visible litter around or buried or burned waste onsite -There are sufficient waste storage containers onsite -Waste management awareness is raised on-site -Waste disposal permits/consents -Environmental, Health, and Safety Statements and Policies	-Project Manager -Construction Contractor, and workers -ESH Officer	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Office waste and electronic waste are mostly recyclable, and should be included in the packaging recyclables. -All packaging waste should be recycled or reused. -All recyclable waste (e.g. bottles, tins, cardboard, paper, plastic packaging) should be neatly stored separately to optimise re-use and the value of the materials to be recycled. -All project personnel should be sensitized to dispose of waste responsibly and not litter. No waste should be left scattered on and around the site. All solid waste should be disposed of in the appropriate containers on-site. -The project sites should be equipped with different waste bins for each type of solid waste. -No burying of waste is allowed on site. -No waste should be burned. Any packaging (e.g., cement bags) that is combustible is also potentially recyclable or			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		reusable, and measures should be taken to prevent such waste from being 'wasted' by inadequate separation and storage. -All domestic and general waste should be contained until such time that it will be transported to designated waste sites weekly or as required. -Any waste that is stored temporarily at the site must be secured to avoid it being blown into the surrounding areas and to prevent it from being scavenged by animals. -Measures must be taken to prevent any waste from attracting scavengers (e.g., kitchen waste should not be left to rot in the open so that it generates smells which will attract animals). -Any waste that cannot be composted or reused, or recycled should only be disposed of at an approved waste disposal site.			
	Hazardous waste (fuels, oils, grease, etc.).	-Hazardous waste should be separately handled and stored until it can be transported to an approved hazardous waste site. Such sites in Namibia	-All the hazardous waste is contained in designated containers on-site -All emergency procedures relaxed or accidental spills of hazardous substances are in	Oshikoto Regional Council -Construction Contractor	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		are found only in Windhoek and Walvis Bay. -Any spillages of potentially toxic materials, whether by accident or through negligence, must be reported and the corrective action must be undertaken to 'clean' and to remove the evidence of the spillage. -Make use of design structures and transfer equipment to avoid spillage as far as possible. -Train the staff members on how to make use of the diesel/fuel transfer and to avoid spillage. Fuel storage should be bundled. -Any spillage must be cleaned up immediately by removing the spill together with the polluted soil and disposing of it at a recognized dumping site. -Install oil traps in all appropriate places to collect potentially toxic materials. -When they are made use of, diesel generators on site, they must be placed on concrete slabs. -Any runoff from the work areas, either arising from	place, and some of the workers are trained on handling this.	-Project Manager	

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		wash downs or rainfall, must be channeled into a pollution control pond. -There must be a weekly monitoring of all equipment and work areas.			
	Human waste	-Open defecation on and around the site is strictly prohibited. All personnel should use the provided toilet facilities. -Sewage waste should be regularly disposed of at the nearest treatment facility by an appointed sewage removal contractor.	-Adequate toilets and basic ablution facilities are erected on-site -There is a contract with a Sewage removal operator	-Oshikoto Regional Council -Construction Contractor -Project Manager	Throughout the project phase
	Monitoring of waste treatment and disposal	All waste coming off the site should be recorded as part of the documentation of the Waste Management Plan. Where relevant, receipts for disposals should be provided and recorded as evidence for responsible disposal. All waste transfer documents should be retained by the Project Manager.	Waste disposal records, showing responsible disposal, are retained and available for inspection.	-Oshikoto Regional Council -Construction Contractor -Project Manager and ECO	Throughout the construction phase
Soil and water resources	Soil and water resources pollution	-Simple precautions should be taken to prevent the spillage of pollutants. Proper training of personnel can reduce the likelihood and the frequency of	-No complaints of pollutants on the soils and eventually in the water from the project activities	-Oshikoto Regional Council -Construction Contractor	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		spillages, and can help to make clean-ups effective when needed. -Soil polluted by spills of oil or any other hazardous substance should be collected and transported to an approved hazardous waste treatment facility. -Fuel storage tanks on site should be placed on an impervious surface. -Soil contamination should be minimised by appropriately placing drip trays where spills and leaks are likely. -Washing of equipment contaminated with hydrocarbons, as well as the washing and servicing of vehicles, should take place off-site at a dedicated area where contaminants are prevented from reaching any soil or water. -An emergency preparedness plan, containing the procedures to follow for spills and accidental contamination, should be compiled, and all personnel appropriately trained.	-No visible oil spills on the ground or pollution spots. -Availability of sufficient hazardous waste containers -Non-permeable material to cover the ground surface at areas where hydrocarbons/fuels and oils, and potential pollutants are utilized.	-Project Manager	

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-All wastewater should be contained on site in designated facilities and disposed of per recognised discharge standards, so that it does not reach local groundwater systems. -Depending on the sanitation system that is installed, effluent from the septic tanks or portable toilets should be periodically emptied before reaching capacity, and transported to a recognised wastewater treatment facility			
Water Resources Use	Overuse of water resources	-Although water is needed for many aspects of construction, it should be used sparingly at all times. -All taps, pipes, and tanks must be managed and maintained so that they do not leak. -Water re-use methods should be implemented as far as practicable. For instance, grey water from basins can be redirected for other purposes where low-quality water can be used.	-Water supply agreements - Proof/recording/quantification of water-saving efforts. -Inspection of water storage tanks on site for any leaks	-Oshikoto Regional Council -Project Manager -Construction Contractor	Throughout the construction phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Stormwater management	Stormwater during construction	-Site-specific stormwater management and discharge systems should be properly designed and installed/implemented to prevent potentially contaminated run-off into water bodies, thus causing the transportation of pollutants into surface water resources and eventually groundwater. -Use temporary drainage structures like berms and channels to control runoff during construction. -Install silt fences around the perimeter of disturbed areas to catch sediment-laden runoff. -Create temporary sediment basins to capture and settle out sediment from stormwater runoff before it leaves the site. -Design and implement ditches to direct runoff and promote infiltration.	-The stormwater management measures are in place, and structures are established on-site	-Oshikoto Regional Council -Construction Contractor	Establishment of measures/structures before construction and, where necessary, improvements are made throughout the project phase.
Fire Management	Accidental fire outbreaks	-All personnel must be sensitised about responsible fire prevention and protection measures, and good housekeeping, such as safe housekeeping and disposal of flammable	-No wildfires or open fires recorded (due to presence of workers) -There are sufficient fire extinguishers onsite and in vehicles	-Oshikoto Regional Council -Project Manager -Construction Contractor	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		materials. Regular inspections should be carried out to ensure housekeeping activities are implemented. -Sufficient firefighting resources should always be accessible on site. This includes serviced fire extinguishers and a sufficient number of personnel trained in basic firefighting skills. -Regular check-ups of the fire-fighting equipment and water supply should be carried out. -No open fires should be made on site. -For smokers, dedicated smoking areas should be demarcated and signposted. Cigarettes should be completely put out and disposed of in allocated ash trays at the smoking area. -Places with fire risks such as fuel storage tanks should be marked as such with clearly visible signage. -Fire precautions should be in place according to information provided in the Material Safety Data Sheets	-Sufficient personnel are trained on basic fire fighting -Emergency procedures and protocols for fire management are in place and personnel are trained		

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		for all chemicals used on-site. -The emergency response plan should include details on the coordination of emergency response procedures, details to surrounding users, undertaking of fire drills, etc., and emergency contact details -The emergency response plan should address the potential fire hazards arising from the substances used on site, and holistic fire prevention and protection measures.			
Biodiversity (Fauna and Flora)	Loss of biodiversity: Fauna	-Strict conditions prohibiting trapping, killing, and disturbing any animals should be part of the employment contracts for all staff. Incorporate Environmental awareness and biodiversity preservation into the employment contracts for all workers. -All workers on site should be instructed, and it should be written into their contracts, that intentionally disturbing or killing any animals found on and around the site is	-Training certificate for the ESH officer/ECO in snake handling and snakebite treatment. -MEFT permit to remove reptiles or other small animals from the work area. -No complaints of local animals killed or stolen by project workers. -No intentional disturbance and destruction of site vegetation and faunal species.	-Oshikoto Regional Council -Project Manager -Construction Contractor	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		prohibited. Disciplinary action, such as dismissal, should be taken against any employees failing to comply with this condition. -Train the ESH officer/ECO in snake handling and snakebite treatment, in preparation for removing snakes or other reptiles when necessary. -Strictly restrict construction activities and land clearing to the construction site to prevent unnecessary habitat loss. -Refrain from disturbing, snaring, killing, or stealing any animals on and around sites and the general area. -Construction trenches and holes should be secured (temporary fencing), then backfilled and capped, to prevent injuries to local animals if they fall in. -Educate the workers to let reptiles such as snakes and lizards go and not kill or injure them in any way. -Environmental awareness on local animals and plants should be provided to the workers and contractors. This should be provided via posters, occasional			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		briefings from the ECO, and by demonstrating good practice when any opportunity arises (e.g., by removing any tortoise from the site so as to prevent it from being captured and removed).			
	Loss of biodiversity: Flora	-Strict conditions prohibiting harvesting and disturbing plants should be part of the employment contracts for all staff. - Vegetation found on the site should be left undisturbed as far as possible. Where clearing of vegetation is necessary, plants should be removed with minimum disturbance of the soil, because soil disturbance causes more intense regrowth of weeds afterwards, including invasive, alien, and toxic species. Cleared plant matter should be dumped into small compost heaps around the edge of the site, where the material can decompose or dry up. -Where regrowth of weeds does occur, they should be cleared by hand to prevent further soil disturbance and dumped on the compost heaps that have been	-No disturbance to unmarked areas. -No complaints from locals regarding unauthorised vegetation removal or cutting down of trees. -Barricading tape (to indicate working areas) -Visible preservation of onsite vegetation - No open fires made on site.	-Oshikoto Regional Council -Project Manager -Construction Contractor	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		created for cleared plant material. -There are no plants of high conservation concern that occur in the project area itself. Thus, no permit to remove any tree would be required. However, continued protection and conservation of on- and off-site vegetation should be maintained. -Vehicle movement should be restricted to existing roads and approved additional road access to prevent unnecessary damage to the surrounding vegetation. -No onsite vegetation should be cut or used for firewood. -Access roads should be created in a manner that disturbs minimal vegetation. -Environmental awareness on faunal and floral biodiversity preservation should be provided to the workers and subcontractors. This should be incorporated into the workers' contracts.			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Noise	Noise nuisance	-There is little that can be done to reduce the noise of active trucks and heavy vehicles. Therefore, efforts should be made to reduce this problem can be reduced, namely: servicing and maintenance of vehicles, PPE for staff dealing with high-noise generating activities. -Oshikoto Regional Council should do everything in its power to keep the main road in good condition. Corrugations greatly increase the rattling and shaking noises of delivery trucks. -Vehicle movements to and from the site should be limited to daylight hours. -A complaints register should be kept to manage noise-related complaints.	-No complaints of excessive noise from the communities -There is a complaint logbook onsite -Noise protective equipment is provided to workers in high-noise generating areas -Delivery and offloading of materials and goods are not done between 5 pm and 08 am.	-Oshikoto Regional Council -Construction Contractor -Project Manager	Throughout the project phase
Dust	Compromising the surrounding air quality	-Dust suppression measures, such as watering the road during periods of peak construction traffic, should be implemented by the Proponent. Application of chemical dust suppressants should be considered in those zones along the route where dust will be most problematic.	-No complaints from the public about excessive vehicle emissions and dust generation related to the project vehicles. -Visible efforts to curb dust -Use of dust suppressants (such as water)	-Oshikoto Regional Council -Construction Contractor -Project Manager	Throughout the construction phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-The general speed limit on the construction site must be kept below 40km/h to limit dust generated by construction traffic.			
Health and Safety	Occupational Health and Safety risks (project-related personnel)	-Perform regular safety inspections to identify potential hazards such as fall risks, electrical risks, or improper storage of materials and tools. -Appropriate and adequate personal protective equipment (PPE) should be provided to personnel. Training on the use of PPE should be given to ensure that workers understand when and how to properly use the equipment. -Electrical hazards and risks should be identified and protected against, ensuring that all live components are safely handled and isolated during work. -Elevated work areas should be identified and given protection for fall risks (e.g., guardrails, personal fall arrest systems). -First-aid kits should always be readily available on-site and functional.	-Zero workplace injuries (fatalities, lost-time injuries, minor injuries). -Comprehensive health and safety plan for all construction activities compiled. -Quarterly refresher training on health & safety -Occupational Health and Safety Personnel Health and Safety Trainings -Compliance with PPE usage -Availability of fully-furnished first aid kits -Trained workers to administer first aid -Sex and Health Education/Awareness -The internal grievance redressal mechanism is developed by Oshikoto Regional Council	-Oshikoto Regional Council -Construction Contractor -Project Manager -ESH Officer	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-First-aid trained personnel should be available on-site, particularly in high-risk areas. -An internal GRM must be developed to deal with grievances raised by project personnel. -All personnel should be trained in/sensitised to the potential health and safety risks associated with their respective responsibilities. -Before operating and using site machines and equipment, personnel involved in different project tasks should be trained on how to properly and correctly use these. This will include ensuring that the workers are made aware of risks associated with being exposed to welding light and fumes, structural failures, and working at heights. Appropriate PPE and procedures should be put in place. -Heavy vehicles, equipment, and fuel storage sites should be properly secured and appropriate warning signage placed where visible.			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Ensure that goods and projected loads are securely fastened to vehicles to avoid falling off and causing injuries. -No personnel should be allowed to enter the working sites when under the influence of alcohol. -Warning signage should be written and erected at hazardous site areas, such as open trenches onsite. -An emergency preparedness plan should be compiled, and all personnel appropriately trained. -Engage workers in sexual health talks and training about the risks of unprotected sexual relations, such as HIV/AIDS and other sexually transmitted infections. -Condoms and sex education pamphlets should be freely provided and addressed in health training sessions. These can be obtained from the nearest local health facility in Onyuulaye, and if needed, health care services should be obtained from Omuthiya.			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Train all project-related personnel on environmental awareness, the Proponent's internal Environmental Health and Safety Policy, and this EMP.			
	Community health and safety risks	-As far as possible, local people should be hired to minimize the number of outsiders who come into Onyuulaye as job seekers. The temporary stay of outsider men often results in increased harassment of girls and women, and other social disruptions. -Loads on delivery and haul vehicles should be securely fastened to avoid objects falling off, causing accidents, and injuring people along the roads during transportation. -As far as possible, deliveries should be scheduled to minimise the number of trips. This is to reduce the nuisance and risks of the movement of heavy vehicles to and from the site. -The movement of heavy vehicles to and from the site should be limited to daylight hours only. No movement of project-	-The majority of the workforce is made up of people from Onyuulaye and surrounding areas -No complaints of late-night deliveries or movement of heavy vehicles(trucks) to and from site -There is effort to suppress dust on problematic sections of access roads -Loads are tightly fastened to the delivery vehicles. -No records or complaints of project loads falling off vehicles to and from site -Vehicles are driven at the recommended speeds and not over speed -No unauthorized access to site	-Oshikoto Regional Council -Construction Contractor -Project Manager -ESH Officer	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		related heavy vehicles should be allowed between sunset and sunrise. -Dust emanating from problematic areas of local roads and other access roads, and during periods of peak deliveries, should be suppressed, using water sprayers and/or chemical dust suppressants. -Vehicle drivers should stick to the authorized speed limits on and off-site to reduce dust generated on the roads. -Open fires on-site and in adjacent project-related areas should be strictly prohibited. This is to prevent veld fires that can damage property (e.g., fences, houses, animals, etc.) and grazing areas. -Unauthorised entry to certain no-go areas for safety reasons, or wandering onto neighbouring properties without permission, should be prohibited. Any project-related personnel found guilty of trespassing onto neighbouring property should be disciplined as per			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		the Proponent's code of conduct. -The cutting down or damaging of community and private vegetation without permission is strictly prohibited. -Efforts should be made by the Oshikoto Regional Council to build local skills and capacity as far as possible. In the bigger picture, helping local people to help themselves, through providing services and creating small businesses, is beneficial to reducing poverty and growing a stable economy in Namibia.			
Risk of Worker Injuries, Accidents, Risk of Electrical Shock, and Fire Hazard	Electrical shocks due to poor installations or miswiring	-Implement a comprehensive health and safety plan that includes emergency response procedures, first aid, and firefighting measures. -Provide appropriate personal protective equipment (PPE), such as gloves, helmets, and fire-resistant clothing. -Ensure all electrical installations follow international safety standards (e.g., insulated cables, earthing systems) to	Number of recorded accidents or injuries during construction and operations. -Percentage of workers trained on safety protocols, including electrical safety and fire prevention. -Compliance with health and safety regulations, including electrical and fire safety standards. -Frequency and effectiveness of safety drills (e.g., fire and electrical emergencies).	-Construction Contracttor -Project Manager	Pre-operations and throughout the phase, when required, and when the need arises

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		prevent electrical shock risks. -Install fire suppression systems (e.g., fire extinguishers, sprinklers) in high-risk areas such as electrical rooms or transformer stations. -Conduct regular safety training for workers on electrical safety, fire hazards, and emergency protocols. -Implement lockout/tagout procedures for electrical systems during maintenance and repair. -Perform routine safety audits and inspections of the site to identify and mitigate potential hazards.			
Vehicular traffic	Vehicular traffic safety	-All drivers of the project vehicles should have valid and appropriate driving licenses to operate such vehicles. -Vehicle drivers should adhere to all standard road safety rules. A maximum speed of 40km/hr on the road is recommended to minimize dust generation, which affects visibility on the road, potentially causing accidents.	-No complaints from the public/communities regarding vehicular traffic issues related to the project activities. -All personnel operating the project vehicles and machinery are appropriately licensed and possess valid driving licenses.	-Oshikoto Regional Council -Construction Contractor -Project Manager	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Project vehicles should be in a roadworthy condition and serviced regularly to avoid accidents as a result of mechanical faults in vehicles. -No heavy trucks or project-related vehicles should be parked outside the allocated or designated project site boundaries.			
Archaeological and heritage resources	Unintentional discovery of archaeological and heritage resources	-Caution should be exercised when carrying out excavations on site, if archaeological/heritage remains are discovered -If any heritage resources are discovered, the steps outlined in the National Heritage Council's 'Chance Finds Procedure' should be followed. -Personnel should be informed not to destroy, damage, or throw away any suspected heritage object found on site during operations, but to report these objects to the Project Manager or ESH Officer. -If any significant archaeological or heritage objects are found, construction activities in that area should be stopped immediately. The	-Preservation of all artefacts and objects that are discovered on and around project site -Salvage equipment -Flag tapes -GPS (site marking) of any archaeological or heritage find.	-Construction Contractor -Project Manager	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		Project Manager or EHS Officer should be called to the spot to assess the situation and advise on the protection of the heritage objects. -The Project Manager and ESH Officer should familiarise themselves with the NHC's Chance Find Procedure. If uncertain about the procedure, they should receive training from a suitably qualified archaeologist for the identification of archaeological/heritage remains and the procedures to follow if such remains are discovered during operation.			

3.1.3 Mitigation Measures for the Operational and Maintenance Phase

Objective: To manage the project with minimal disturbance to the surrounding biophysical and social environment, and to ensure that the electricity is generated and distributed sustainably for the country while protecting the host environment.

Who is responsible?

- The Project Manager should ensure that the relevant sections of this EMP are included as his/her duties
- The Project Manager should keep track of EMP implementation on an ongoing basis. This information will aid in the compilation of the Monitoring Reports that must be submitted to MEFT on a 6-month basis, and which will be required when renewal of the ECC is needed after every 3 years.
- It is likely that the ESH Officer's responsibilities identified herein can be carried by the Project Manager in the operational phase.

Table 3-3. Recommended Impact Management Plan Actions for the proposed activities (Operational and Maintenance phases)

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
EMP implementation	Lack of EMP awareness and implications thereof	-The ESH officer should manage the EMP implementation and monitoring. -An EMP non-compliance penalty system should be implemented on-site. -An external ECO should continue with auditing the EMP implementation and compliance check biannually from the last audit/monitoring report of construction works. -All the site working areas, including access roads, should be inspected daily for the actual implementation of relevant aspects of this EMP. Reports of non-compliance and ineffective measures should be compiled for auditing.	-All required EMP implementation Plans and Systems are compiled and in place for the operational phase -An ESH Officer/ECO is retained for the project -The EMP non-compliance penalty system is maintained -Bi-annual Environmental & social monitoring reports are compiled by an external ECO and submitted to MEFT bi-annually	-Oshikoto Regional Council -Project Manager	Pre-operations and throughout the phase, when required, and when the need arises
Waste management	Environmental pollution from solid waste - Please also refer to the Waste	**Please refer to the construction phase measures**	-No visible litter around or buried or burned waste onsite -There are sufficient waste storage containers on-site	-Project Manager -Workers	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	Management Plan		-Waste disposal permits/consents -Environmental, Health, and Safety Statements and Policies		
	Human waste	-Open defecation on and around the site is strictly prohibited. All personnel should use the provided toilet facilities.	-Adequate toilet and basic ablution facilities are available on-site	-Oshikoto Regional Council -Project Manager	Throughout the project phase
	Hazardous waste (fuels, oils, grease, paints, etc.).	**Please refer to the construction phase measures, as necessary**	-All the hazardous waste is contained in designated containers on-site -All emergency procedures related to accidental spills of hazardous substances are in place, and workers are trained on handling this.	Oshikoto Regional Council -Project Manager	Throughout the project phase
Wastewater	Soil and water pollution	-The possibility of leakages at the infrastructure sites must be managed by ensuring that the condition of any pipelines and surfaces is	-No complaints of pollutants on the soils and eventually in the	-Project Manager	Throughout the project

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		monitored for leaks and runoff by the manager and staff members. -The staff must monitor and limit water consumption as efficiently as possible. -A water meter must be installed, and it must be checked regularly to keep a register of water consumption and to monitor trends. -Special care should be taken to prevent chemicals from washing/leaching into surface or groundwater systems. - The conditions as stated under the Waste Water Permit obtained during construction are adhered to at all times. **Please also refer to the measures provided under the construction phase.**	water from the project activities -No visible oil spills on the ground or pollution spots.		
Energy consumption	Over-utilization of energy sources	-Only make use of generators as an emergency source of electricity, as continued operation thereof normally creates additional noise, requires the bulk storage of fuel and oil, which can harm the environment if not managed properly.	-Energy/power is used sustainably -Generators are only used when necessary	-Oshikoto Regional Council -Project Manager	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Water Resources Use	Overuse of water resources	-Water should be used sparingly at all times. -All taps, pipes, and tanks must be managed and maintained so that they do not leak. -Water reuse methods should be implemented as far as practicable. For instance, grey water from basins can be redirected for other purposes, where low-quality water can be used	-Water supply agreements -Proof/recording/ quantification of water-saving efforts. -Inspection of water storage tanks on site for any leaks	-Oshikoto Regional Council -Project Manager	Throughout the project phase
Fire Management	Accidental fire outbreaks	**Please also refer to the measures provided under the construction phase**	-No wildfires or open fires created by the workers were recorded -There are sufficient fire extinguishers on-site and in vehicles	-Oshikoto Regional Council -Project Manager	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
			-Sufficient personnel are trained in basic firefighting -Emergency procedures and protocols for fire management are in place, and personnel are trained.		
Biodiversity (Fauna and Flora)	Loss of biodiversity: Fauna and Flora	-Strict conditions prohibiting trapping, harvesting, killing, and disturbing any animals and plants should be part of the employment contracts for all staff. Incorporate Environmental awareness and biodiversity preservation into the employment contracts for all workers. -Environmental awareness on local animals and plants should be provided to the workers and contractors. This should be provided via posters, occasional briefings from the Environmental Officer, and by demonstrating good practice when any opportunity arises (e.g., by removing any tortoise from the site so preventing it from being captured and removed). -Do not allow the planting of alien plants on and around the site.	-No complaints and no incident reports of livestock theft or wildlife hunted in the area by the project workers. -No unauthorised vegetation removal or cutting down of trees. -Contact details of the Anti-poaching Police Unit are provided and visible on-site	-Oshikoto Regional Council -Project Manager	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		Please also refer to the measures provided under the construction phase			
Community liaison	Lack of respect for the community and private properties and surroundings	-The manager must have sound relations with communities in the vicinity. -They may not damage any cultural or archaeological sites. -Employ as many local people as possible for all levels of operation. -Make use of dispute resolution methods and labour practices that are within the law and cultural norms. -All staff must be trained so that they have the knowledge to do their work properly. -The manager must provide opportunities for career advancement and skills development. -Site staff and visitors should be informed to refrain from wandering into unauthorized areas on private land. Therefore, trespassing is prohibited.	-A good community relationship is established and maintained -Grievances raised should be resolved amicably -No reported trespassing by the landowner or neighbours owing to project workers	-Oshikoto Regional Council -Project Manager	Throughout the project phase
Health and Safety	Occupational Health and Safety risks (project-related personnel)	-Personnel on site should be trained in handling emergencies such as response to fire, accidents, etc. -There should be careful planning of emergency procedures.	-Annual refresher training on health & safety -Occupational Health and Safety Personnel Health and Safety Training	-Oshikoto Regional Council -Project Manager -ESH Officer	Throughout the project

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Training in first aid and emergency response to employees on site should be done. -There should be full compliance with the Labour Act (No. 6 of 1992), particularly its provisions about occupational health and safety, e.g., with hazardous substances. - Workers should have full protection against dust and noise in the workplace.	-Availability of fully-furnished first aid kits -Workers trained workers to administer first aid Documentation of Health Education/Awareness		
Vehicular traffic	Vehicular traffic safety	**Please also refer to the measures provided under the construction phase.**	-No complaints from the public regarding vehicular traffic issues related to the project activities. -All personnel operating the project vehicles and machinery are appropriately licensed and possess valid driving licenses.	-Oshikoto Regional Council -Project Manager	Throughout the project phase

3.2 Key Roles and Responsibilities in Implementing the EMP

The successful implementation of the Environmental Management and Monitoring Plan (EMP) for the proposed project requires a coordinated approach among various persons involved in the project implementation. The roles and responsibilities of these parties must be clearly defined to ensure effective management of environmental impacts throughout the project lifecycle, from construction to decommissioning.

Below is an outline of the key roles and responsibilities for implementing the EMP:

3.2.1 Project Manager

The Project Manager is responsible for overseeing the overall progress of the project, ensuring that the project meets its timelines, budgets, and performance goals, while integrating environmental considerations into the project management process

Key Responsibilities:

1. Ensure the allocation of resources for the implementation of the EMP.
2. Monitor the integration of environmental measures into the project's workflow.
3. Collaborate with the EHS Officer or ECO to resolve issues related to environmental management.
4. Report on the project's progress to stakeholders, ensuring transparency in environmental performance.
5. Oversee the overall implementation of the EMP, ensuring that all environmental management practices are followed and compliance with environmental regulations is maintained

3.2.2 Environmental, Health and Safety (EHS) Officer or Environmental Control Officer (ECO)

The Environmental, Health & Safety (EHS) Officer or ECO is responsible for ensuring the safety and well-being of all workers during construction and operation, with a focus on preventing accidents, injuries, and health risks.

Key Responsibilities:

1. Develop and maintain the EMP.
2. Monitor the performance of mitigation measures and identify areas for improvement.
3. Conduct regular audits and inspections.
4. Ensure that environmental data and reports are accurately recorded.
5. Provide training and support to staff on environmental best practices.
6. Liaise with regulatory authorities to ensure compliance with relevant environmental laws and regulations
7. Develop and implement a health and safety plan.
8. Conduct safety inspections and enforce safety protocols.
9. Monitor the implementation of fire safety and electrical safety measures.
10. Ensure workers are provided with appropriate personal protective equipment (PPE).
11. Conduct safety training and emergency response drills.

Furthermore, the EHS Officer/ECO serves as the Environmental Monitoring Team, responsible for collecting and analysing environmental data to assess the effectiveness of mitigation measures and ensure compliance with environmental standards.

Key Responsibilities:

1. Conduct regular environmental monitoring (air quality, noise levels, and biodiversity).

2. Prepare and submit monitoring reports.
3. Identify any deviations from set environmental standards and report them to the Environmental Manager.
4. Recommend corrective actions to minimize environmental impacts.

3.2.3 Site Supervisor/Construction Contractor

The Construction Contractor is responsible for ensuring that construction activities are carried out in line with the EMP and that environmental mitigation measures are effectively implemented on-site.

Key Responsibilities:

1. Implement on-site environmental and safety procedures.
2. Ensure that construction activities do not negatively impact surrounding ecosystems.
3. Monitor and manage on-site waste disposal, dust, noise, and soil erosion.
4. Oversee the installation of erosion control measures, stormwater management systems, and environmental monitoring equipment.
5. Report on progress and environmental compliance to the Project Manager and ECO/EHS Officer.

3.2.4 Local Communities and Stakeholders

Although not responsible for the implementation of the EMP, the local communities and stakeholders play a crucial role in ensuring the success of the EMP implementation in supporting the implementation of the EMP, providing valuable insights into local environmental concerns, and ensuring that the project benefits local development.

Key Responsibilities:

1. Engage in consultations and contribute to decision-making processes regarding the project's environmental management.
2. Report any environmental concerns or violations to the responsible parties.
3. Participate in monitoring and feedback programs, especially regarding biodiversity, noise, and visual impacts.

By ensuring clear communication and collaboration between these key stakeholders, the EMP can be effectively implemented, leading to minimized environmental impacts and the successful implementation of the project.

4 DECOMMISSIONING AND REHABILITATION OF DISTURBED AREAS ON-SITE

Once construction is completed, the Construction (Installation) Contractor will need to implement site rehabilitation measures. Decommissioning and rehabilitation are primarily reinforced through either progressive rehabilitation while construction work is ongoing or rehabilitating disturbed sites after completion of work, which consists of safety, health, environmental, and contingency aspects. For safety, health, and the environment, rehabilitation of the site post-construction will include the following:

- Dismantling and removal of construction campsites and associated infrastructures from the project sites,
- Carrying away all project equipment and vehicles, and

- Clean up of site working areas and transporting the recently generated waste to the nearby approved waste management facility (as per agreement with the waste facility owner),

Further decommissioning and rehabilitation practices at the site will include:

- Backfilling of all holes and trenches (if any) associated with the construction activities in the area,
- Closing and capping of road construction holes to ensure that they do not pose a risk to both people and animals in the area, and
- Levelling of stockpiled topsoil, which will be done to ensure that the disturbed site areas are left as close to their original state as possible.

5 CONCLUSIONS AND RECOMMENDATIONS

The EMP for the proposed development of municipal infrastructure in Onyuulaye provides a comprehensive framework for managing and mitigating environmental impacts throughout the project's lifecycle, from construction through to decommissioning. Based on the identified potential environmental impacts and the mitigation measures outlined, the following key conclusions can be drawn:

Environmental Impact Mitigation: The EMP outlines effective mitigation measures to address the most significant environmental impacts associated with the project, including biodiversity preservation, soil conservation, water use management, and the reduction of pollution risks. These measures, if rigorously implemented, will minimize adverse effects on the environment.

Compliance with Regulations: The project is expected to adhere to Namibia's environmental legislation, including the Environmental Management Act and other relevant regulations. Through proper management and monitoring, the project will comply with national and, where necessary, international standards for environmental protection.

Health and Safety Focus: Ensuring the health and safety of workers is important. The implementation of safety protocols, regular training, and emergency preparedness will reduce the risk of accidents, injuries, and fire hazards, creating a safe working environment.

Long-Term Sustainability: The EMP's focus on environmental monitoring and adaptive management ensures that the project can achieve long-term sustainability. Post-project land rehabilitation will help return disturbed areas to productive uses and restore local ecosystems where possible.

Stakeholder Engagement: Continuous engagement with local communities, stakeholders, and regulatory authorities will ensure that the project benefits from local knowledge and that any concerns related to environmental impacts or land use are addressed effectively.

Recommendations:

To further enhance the successful implementation of the EMP and ensure the long-term success of the project, the following recommendations are made:

Regular Monitoring and Auditing:

Establish a robust monitoring program that includes regular environmental audits, inspections, and performance evaluations. This will ensure the effectiveness of mitigation measures and provide early identification of any emerging issues. Periodic environmental reports should be submitted to relevant authorities to demonstrate compliance with environmental standards and to share progress.

Continuous Training and Capacity Building:

Conduct regular environmental and safety training for workers, ensuring that they are up to date with best practices in environmental protection, health, and safety protocols. Invest in capacity-building programs for local communities, so they can actively participate in environmental monitoring and project management.

Strengthening Emergency Response and Contingency Plans:

Ensure that comprehensive emergency response plans are in place for all potential incidents, including fires, electrical shocks, and contamination. These plans should be regularly tested and updated based on new risks identified during the project lifecycle.

Adaptive Management Approach:

Implement an adaptive management approach to environmental management, where mitigation measures are adjusted based on continuous monitoring data and feedback from the local community. This will allow for flexibility and ensure that unforeseen environmental issues are effectively addressed.

Promote Collaboration with Local Authorities and Communities:

Strengthen collaboration with local communities and stakeholders through regular consultations and feedback mechanisms. Involve them in the monitoring process and keep them informed about the project's progress, environmental status, and mitigation efforts.

Post-Project Land Rehabilitation:

Develop a clear post-decommissioning plan that focuses on rehabilitating disturbed areas and returning them to sustainable use.

Ensure Effective Waste Management Systems:

Invest in waste management infrastructure to avoid contamination and pollution. This includes establishing efficient recycling programs, minimizing waste generation, and properly disposing of hazardous and non-hazardous materials.

ANNEXURE 1: ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES FOR THE PROPOSED OXIDATION PONDS IN ONYUULAYE SETTLEMENT

Table 1: Management and mitigation measures for the Planning & Design, Construction, and Operational & Maintenance of the oxidation ponds

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
PLANNING & DESIGN PHASE				
EMP implementation and training	Lack of EMP awareness and implications thereof	-A Comprehensive Health and Safety Plan for the project activities should be compiled. This will include all the necessary health, safety, and environmental considerations applicable to the respective works on sites. -An EMP non-compliance penalty system should be implemented on-site. -Appoint an EHS Officer to be responsible for managing the EMP implementation and monitoring for the project.	-Oshikoto Regional Council	Pre-ground preparatory works and subsequent phases
Oxidation Ponds Technology	Mechanical and design failures	-All manufactured materials will be required to bear the mark of SABS/SANS approval. -The machinery and equipment are designed in such a way that mechanical failures are minimal to none. -The evaporation pond should be sufficiently sized and capable of achieving the evaporation of the sewage inflow load and thus, compliance with the Guidelines. -The ponds' design should make provision for groundwater protection (an appropriate liner to prevent infiltration from the bases of the ponds) -The ponds' design should include odour control caps. -The pond system should be properly designed to ensure the capacity to treat all the sewage pumped into it and ensure that the	-Oshikoto Regional Council -Project Design/Consulting Engineer -Project Manager	Pre-construction

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		effluent is fit and meets the Standards before it can be used for its intended application in the environment (post-treatment).		
Oxidation Ponds' Maintenance	Cleaning and reconditioning of ponds	-The cleaning and reconditioning works of the constructed ponds during the operational phase should be planned and provided for. This included the provision for the maintenance and repair of the associated pond system infrastructure. -Financial and technical provision should be made for the operational & maintenance, and updated regularly.	-Oshikoto Regional Council -Project Manager	Throughout the project life cycle
Authorizations	Lack of Permits/ Licenses	-All the required agreements and licenses, or permits should be applied for and obtained, and kept on record. The permits, agreements referred to herein include: o Petroleum storage permits (if fuel is stored on site in the volume of 600 litres and more) (who? the Contractor) o Waste disposal authorization (who? the Contractor)	-Oshikoto Regional Council -Construction Contractor -Project Manager	Pre-construction
Labour recruitment	'Outsiders' or out-of-area people (businesses) are often given employment and tender opportunities at the expense of locals who can perform the same work. This may result in conflicts between locals and construction contractors.	-Priority for most work to be done during the construction and operational phases should be given to locals, if they have the skills to undertake the work. -Wherever possible, the majority of personnel should be hired locally, thus minimising the need to bring in staff from outside areas. -Employment of out-of-area people should only be considered if the local community does not have the required skills. -Employment should be conducted through the Okankolo Constituency office, as this way, the Constituency Councillor can assist the Contractor in obtaining suitable people for construction. -Recruitment of workers should not be done on site, but only through the Okankolo Constituency office.	-Construction Contractor in partnership with the Okankolo Constituency councillor and or existing local development committee (if any) to determine employment considerations.	Pre-construction (for construction works) Pre-operational phase (for operational works, if external personnel are required by the Oshikoto Regional Council)

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-Employment of women, marginalised people, and people with disabilities should be encouraged, where possible.		
Procurement of goods and services for Ground preparatory works & construction contractors, and services		-The procurement stage for the project construction works should follow a fair and transparent process. -Skills transfer and capacity building should be prioritized during construction. This is important that if the construction contract is awarded to an out-of-town company, they should be instructed to team up with a local company to ensure capacity building for locals. -Encourage the provision of goods and services that are locally available should be sourced from the locally available businesses, especially small and medium businesses. -During the drafting of tender documents, the consultant shall include provisions designed to maximise the use of local labour. All unskilled labour shall be sourced from Onyuulaye and the surrounding areas. Specific recruitment procedures shall be spelled out.	-Oshikoto Regional Council: Procurement -Construction Contractor	Pre-construction (for construction works) Pre-operational phase (for operational works, if an external service provider/contractor is required)
Vegetation/Flora	Site clearing resulting in loss of vegetation species (protected ones)	-Consult the Forestry Office in Onankali for site inspection and counting of trees and further advice on permit application and fees to remove trees. -Should there be a need to remove certain protected tree species within the intended footprints of the site, a permit should be applied for and obtained from the Directorate of Forestry Office in Onankali.	-Construction Contractor -ECO	Pre-removal of the tree(s)
Stormwater control	Risk of water pollution owing to a lack of stormwater management systems (run off)	-Site stormwater management plans (discharge points) should be properly designed to prevent the potentially contaminated run-off from reaching water resources.	-Construction Contractor -ECO	Pre-construction

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-To prevent waste discharges from contaminating surface and groundwater, the discharges must be diverted away from surface water and onto turf areas or other appropriate areas. -The ponds should be lined to prevent waste from leaching into the ground, and potentially into groundwater.		
Social conflicts	-Nuisances caused by the Contractor -Lack of communication between the contractor and the community	-A meeting should be arranged with the local community once the contractor has been appointed. -The contractor shall appoint an ECO/EHS Officer from the construction team to take responsibility for the implementation of all provisions of this EMP	-Oshikoto Regional Council -Construction Contractor and their subcontractor(s)	Pre-construction
Construction schedule	Schedule	-A convenient construction work/schedule should be prepared and shared with the Okankolo Constituency Office to inform the local community of when to expect the construction works in the area.	-Construction Contractor	Pre-construction
Wastewater	Treated Wastewater / Effluent Discharge	-A Permit to discharge treated effluent/wastewater should be applied for and obtained from the Department of Water Affairs (DWA)' Water Environment Division.	-Oshikoto Regional Council	Pre-ground preparatory works and operational phase
Stormwater and Pond overflow management	Runoff of polluted water into the environment	-Stormwater management plans (discharge points) should be designed and implemented onsite to prevent the potential contaminated run-off from reaching surface water resources during heavy rain seasons. -The ponds should be equipped with a robust wastewater flow monitoring system to ensure that the first sign of overflow is detected and addressed in time (for flow and capacity monitoring in ponds).	-Construction Contractor	Pre-ground preparatory works and construction phases
Communication between the	Lack of communication (proper liaison) between	-A clear communication procedure/plan, which should include a grievance mechanism, should be compiled.	-Construction Contractor -Project Manager	Before construction works and

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
Proponent and residents	the community and the Proponent			throughout the subsequent phases
CONSTRUCTION AND OPERATIONAL PHASES				
EMP implementation and training	Lack of EMP awareness and implications thereof	-EMP training should be provided to all new workers on-site. -All site personnel should be aware of the necessary health, safety, and environmental considerations applicable to their respective work -The implementation of this EMP should be monitored. -The site should be inspected, and a compliance audit done throughout **the site as recommended below:** ○ **Daily to weekly - construction phase** ○ **Biannually - operational** -An EMP non-compliance penalty system should be implemented on-site. -Compliance monitoring is conducted daily during ground preparatory works and construction. -The ECC should be renewed on time every 3 years, at least 1 month before it expires.	-Oshikoto Regional Council -Project Manager -EHS Officer/ECO -	Throughout the construction and operation phases
Communication between the Proponent and residents	Lack of communication (proper liaison) between residents and the Proponent	-A clear communication procedure/plan, which includes a grievance and response mechanism, should be compiled.	-Oshikoto Regional Council -Project Manager -Construction contractor	Communication is to run throughout the project activities.
Soils	Site soils (land) disturbance Soil erosion	-The topsoil stripped from certain site areas to enable construction works and can be returned to its initial position, should be returned. This is to avoid unnecessary stockpiling of site soils, which would leave them prone to erosion.	-Construction Contractor -EHS Officer	Throughout the construction phase operational phase -Soil contamination monitoring to be

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-All construction pits excavated on site should be rehabilitated and returned to their pre-excavation state as much as possible. -Soils that are not within the intended footprints of the site areas should be left undisturbed, and soil conservation implemented as far as possible. -Project vehicles/machinery should stick to access roads provided and or meant for the project operations, but not to unnecessarily create further tracks on and around the site by driving everywhere, resulting in soil compaction. -Soils that are not within the intended and targeted footprints of the site should be left undisturbed, and soil conservation implemented as far as possible. -Access roads should be designed appropriately in a manner that disturbs as few land areas as possible. -Make use of the existing road network as much as possible and avoid off-road driving.		done once during ground preparatory works
	Soil pollution	-Identify oil storage and use locations on site and allocate drip trays and polluted soil removal tools suitable for that specific surface (soil or hard rock cover) on the sites. -Maintain equipment and fuel storage tanks to ensure that they are in good condition, thus preventing leaks and spills. -The oil storage and use locations should be visually inspected for container or tank condition and spills. -Maintain a fully provisioned, easily accessed spill kit. Spill kits should be located throughout the active project sites, containing the floor dry absorbent material and absorbent booms, pads, and mats.	-Construction contractor -EHS Officer	Throughout the ground preparatory works and construction phases

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-All project employees should be made aware of the impacts of soil pollution and advised to follow appropriate fuel delivery and handling procedures. -Develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible. -Ensure employees receive basic Spill Prevention, Control, and Countermeasure (SPCC) Plan training and mentor new workers as they get hired in each phase of the project. -In the site areas where hydrocarbons will be utilized, the surface should be covered with an impermeable plastic liner (e.g., an HDPE liner), carefully placed to minimize risk of puncturing, to prevent any spillages from getting into direct contact with the soils and prevent eventual infiltration into the ground and pollute groundwater. -Project machines and equipment should be equipped with drip trays to contain possible oil spills when operated. -All wastewater and hydrocarbon substances and other potential pollutants associated with the project activities should be contained in designated containers on site and later disposed of at nearby approved waste sites following MAFWLR's Water Environment Division standards on waste discharge into the environment. This is to ensure that these hazardous substances do not infiltrate the ground and affect the groundwater quality. -In the event of a fuel (diesel) storage tank onsite in a tank mounted on a mobile trailer, drip trays must be readily available on this trailer and monitored to ensure that accidental fuel spills around fuel usage sites are cleaned up on time (soon after the spill has happened). -Polluted soil must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility.		

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-Washing of equipment contaminated with hydrocarbons, as well as the washing and servicing of vehicles, should take place at a dedicated area off-site, where contaminants are prevented from contaminating soil or water resources. -Toilet water should be treated to prevent the waste from being a water pollution risk.		
Water Resources	Water use (quantity) misuse	-Water should be efficiently used by implementing water-saving measures such as recycling and re-use where necessary and possible. -Water conservation awareness and saving measures should be made to all employees and become accountable.	-Oshikoto Regional Council-EHS Officer/ECO -Construction Contractor	During the construction and operational phases
	Water resources (quality) and pollution	**SURFACE WATER** -All run-off materials, such as hydrocarbons, wastewater, and other potential contaminants, should be contained on-site in designated containers and disposed of following municipal wastewater discharge standards, so that they do not reach water systems. -The ponds should be maintained frequently to ensure that no overflow leaves the ponds undetected. -Sediment removal from the ponds should be done at least once a year to prevent overflow due to the thick sediments settling at the bottom of the ponds. **GROUNDWATER** -The base of the ponds should be properly lined with an approved and appropriate liner material (HDPE) to ensure that there will be no direct contact between wastewater in the ponds and groundwater through leakages due to an unlined base or liner failure and poor installation. -Stormwater management plans (discharge points) should be designed and implemented on site to prevent the potential contaminated run-off from reaching surface water resources, and or eventual infiltration into groundwater.	-Ground preparatory works and Construction Contractor -EHS Officer/ECO	-Throughout all the project phases

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-The effluent/wastewater containers or ponds should be lined to prevent dissolved waste from leaching into the ground, and potentially into groundwater systems.		
Biodiversity	Loss of Fauna and Flora	**Flora:** -Make use of the existing access roads as much as possible and avoid off-road driving. -A permit must be obtained from the Directorate of Forestry before any protected species is removed (upon inspection by MEFT's Forestry). -Vegetation found on the site, but not in the actual project footprints, should not be removed but left to preserve biodiversity on the site area. -The movement of vehicles and machinery should be restricted to existing roads and, if necessary, to the newly established tracks only to prevent unnecessary damage to the site vegetation. -No onsite vegetation should be cut or used for firewood related to the project's operations. -Care should be taken when carrying out vegetation clearing without destroying all the site vegetation. -The Proponent should aim to use the already damaged area with little to no vegetation for the development of oxidation ponds.	-Contractor -Project Manager -EHS Officer	-Throughout the phases
Air Quality	Air quality (dust)g	-Ensure that the construction schedule is limited to the given number of days of the week, but not every day. This will keep the vehicle-related dust level minimal in the area, especially when it is windy. -A reasonable amount of water should be used to suppress the dust that may be emanating from certain site areas (limited to the site	-Contractor -Project Manager -EHS Officer/ECO	Throughout the ground preparatory works and construction phases

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		only) or certain parts of the local utilized sandy roads that are generating a lot of dust. -All access roads leading to the site should have speed limits of no more than 40km/h to minimise the amount of dust generated by the vehicles, which will in turn minimise air quality concerns to any potential receptors, particularly the residents south of the site. -Dust masks, eye protective glasses, and other respiratory personal protective equipment (PPE) such as face masks should be provided to the workers on site operating or working at the excavated areas, where they may be exposed to dust. -The vehicles carrying dusty materials should be covered to prevent materials from being blown from the vehicles. -The transportation of project materials, equipment, and machinery should be limited to certain days of the week only to reduce the dust generated by heavy vehicles in the area. -Project vehicles and heavy machines should not be left idling when not in use, as they emit air-polluting gases. -Project vehicles and machinery should be maintained through regular servicing to ensure that they do not release harmful and air-polluting fumes while on and off-site		
	Odour nuisance	-Incorporate odour control technologies such as odour-controlling caps at the ponds.	-Contractor	During construction
Noise	Noise nuisance	-The transportation of project materials, equipment, and machinery should be limited to once or twice a week only, but not every day. -Noise from project vehicles and equipment on site should be reduced to acceptable levels. -Excavations and all activities that are likely to increase noise levels should be conducted between 08h00 AM and 17h00 PM during	-Project Manager -Contractor -EHS Officer/ECO	Throughout ground preparatory works and construction

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		weekdays to avoid noise during the night residents are resting (on weekends) and sleeping (during the night). -The construction times should be set such that no such activities are carried out during the night or very early in the mornings (to be limited between 08h00 AM and 17h00 PM on weekdays). -When operating trucks such as hauling or any high noise level machinery, workers should be equipped with personal protective equipment (PPE), i.e., earplugs, to reduce noise exposure. These PPE should be regularly checked/tested for effectiveness, and on detection malfunction, should be replaced as soon as possible.		
Health, Safety, and Security	General health and safety associated with project activities	-The Labour Act's Health and Safety Regulations should be complied with. -All items for treatment, as specified in the material safety data sheets (MSDS) for hazardous materials, should be available in the first aid kit. -Keep a comprehensive first aid kit at the worksites. -Establish an emergency rescue system for the evacuation of injured people, if needed. -Emergency procedures for accidents shall be communicated to all workers. -Ensure that all workers know where the first aid kits are located and who is trained in administering first aid. -As part of their induction, the project workers should be provided with an awareness training of the risks of mishandling equipment and materials on site, as well as health and safety risks associated with their respective jobs. -Heavy vehicle, equipment, and fuel storage sites should be properly secured, and appropriate warning signage placed where visible.	-Contractor -Project Manager -EHS Officer/ECO -	Before site setup activities and throughout the phases

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-An emergency preparedness plan should be compiled, and all personnel appropriately trained. -Workers should not be allowed to drink alcohol before and during working hours, as this may lead to mishandling of equipment, which results in injuries and other health and safety risks. -The site should be equipped with "danger" or "cautionary" signs for any potential danger or risk area identified on site. -A security guard or guards should be part of the team to look after the project equipment and vehicles that would be left on site in after-hours, weekends, or public holidays to ensure that no unauthorized person enters the area. -All employees and contractors (personnel) to be trained on environmental awareness, internal Environmental Health and Safety Policy, Environmental Management Plan, and engagement with key stakeholders and interested & affected persons.		
	Occupational Health and Safety	-When working on and moving around the site, employees and visitors should be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc. -Provide adequate and appropriate PPE to all workers and visitors. -Timeously recording and reporting of all health and safety incidents.	-Contractor -Project Manager -EHS Officer/ECO	Throughout the project phases and when required
	Public safety	-A razor mesh fence should be erected around the pond area to secure it and prevent possible unauthorized public access, especially local children, as well as animals. -Empty hazardous containers that may be used onsite should be securely kept on site, inside the boundary wall, before transporting the containers to the nearest approved waste site.	-Construction Contractor -Project Manager -EHS Officer/ECO	Throughout all the phases

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-Loads should be securely fastened to the vehicles while in transit (being transported to and from the site).		
Health and safety	Accidental fire outbreak	-Portable fire extinguishers should be provided on site. -No open fires are to be created by project personnel. -Potential flammable areas and structures, such as fuel storage tanks, should be marked as such with visible signage.	-Contractor -Project Manager -EHS Officer	Throughout the ground preparatory works and the construction phase
Archaeology and heritage	Accidental disturbance and destruction of archaeological or heritage objects and sites	-Caution should be exercised when carrying out excavations associated with the project activities if archaeological/heritage remains are discovered. -Identification of any archaeologically significant objects on the site should not be disturbed, but are to be reported to the project EHS Officer/ECO or National Heritage Council offices for further instructions and actions. -Workers should be educated not to destroy or throw away, but report (to the EHS Officer) any unknown object found/discovered on site.	-Contractor -EHS Officer/ECO	As and when required, before site setup activities and upon encounter
Social conflicts	Job seeking, private property intrusion, or damage	-The Proponent should inform their workers on the importance of respecting the locals' properties by not intruding on or damaging their homes or yard fences. -Any workers or site employees who will be found guilty of intruding on people's properties should be called in for a disciplinary hearing and/or dealt with as per their employer's code of employment conduct. -Site workers should be advised to respect the community and locals' private properties, values, and norms. -No worker should be allowed to wander in people's private yards or fences without permission.	-Construction Contractor -Project Manager -EHS Officer	Pre- Construction

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-Site workers are not allowed to kill or in any way disturb local livestock or animals that may be seen on and around the site.		
Post-Treatment Effluent	Handling	-The effluent must be treated thoroughly and tested/analysed to ensure full compliance with the Standards before being used or discharged into the environment. -The effluent logistics should be properly handled and done onsite when delivering to the intended consumers -Effluent that awaits to be transported from the site should be stored in a designated storage area and loaded correctly without spilling on the soils. -Other options for utilizing the effluent should be investigated and implemented to ensure that the effluent is sufficiently treated to the Standards and utilized for other applications in the environment.	-Oshikoto Regional Council -Project Manager -EHS Officer/ECO	Throughout the operational phase
Littering and waste management	Environmental Pollution	-Project workers should be sensitized to dispose of waste responsibly and not to litter. -After each daily work, there should not be waste left scattered on site, but rather be disposed of in allocated site waste containers. -No waste may be buried or burned on site or anywhere else throughout the project lifecycle. -All domestic and general waste produced daily should be contained until it is transported to designated waste sites weekly. -The sites should be equipped with separate waste bins for hazardous and general waste/domestic. -Waste separation at source will be enforced by availing clearly labelled or differently coloured general waste (paper, plastic, organic waste) rubbish bins at all working areas. These must be emptied weekly at the Town's waste dumping site.	-Project Manager -Construction Contractor -EHS Officer	Throughout the phases.

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented.		
	Wastewater generated by workers and visitors (sanitation)	-Provision of toilet facilities for project workers and visitors (type of pit latrine or chemical toilet). -Emptying of chemical toilets according to the manufacturer's specifications. Treating latrine waste to render it non-polluting.	-Contractor -EHS Officer/ECO	At site setup and throughout the phases
	Hazardous waste	-All hazardous materials shall be stored (on a bunded area), handled, and disposed of according to the applicable Material Safety Data Sheet (MSDS), as well as applicable regulations (e.g., the Health and Safety Regulations). -Hazard identification signage shall be erected at appropriate locations. -All hydrocarbon substances should be contained in designated containers on site and later disposed of at nearby approved waste sites. -Hazardous waste, including emptied chemical containers, should be safely stored on site where they cannot be accessed and used by uniformed locals for personal use. These containers can then be transported to the nearby approved hazardous waste sites for safe disposal. No waste should be improperly disposed of on site or in the surroundings, i.e., unapproved waste sites. -As an emphasis on the preceding point, empty hazardous substance containers should not be disposed of anywhere on the project site or its surroundings, but instead they should be kept at a designated storage place on site until such time that they can be safely taken to the nearest approved hazardous waste sites.	-Contractor -EHS Officer/ECO	Throughout the phases.
Vehicular Traffic	Traffic safety	-The transportation of project materials, equipment, and machinery should be limited to once or twice a week only, but not every day.	-Construction Contractor -Project Manager	Throughout the phases

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
		-The heavy truck loads should comply with the maximum allowed limit while transporting materials and equipment/and machinery on the public and access roads. -The site access road(s) should be upgraded to an acceptable standard to be able to accommodate project-related vehicles. -Drivers of all project phases' vehicles should have valid and appropriate driving licenses. -Vehicle drivers should adhere to the road safety rules. -Drivers should drive slowly (40km/hour or less) and be on the lookout for animals. -Project vehicles should be in a roadworthy condition and serviced regularly to avoid accidents due to mechanical faults in vehicles. -Vehicle drivers should only make use of the designated site access roads provided. -Vehicle drivers should not be allowed to operate vehicles while under the influence of alcohol. -Sufficient parking area for all project vehicles should be provided for and demarcated on the sites. -Make provision for safe materials and equipment offloading and loading areas on sites. -No heavy trucks or project-related vehicles should be parked outside the project site boundary or demarcated areas for such purpose. -Truck movements, frequency, times, and routes should be carefully planned and scheduled – please refer to the next point. -To control traffic movement on site, deliveries from and to the site should be carefully scheduled. This should optimally be during weekdays and between the hours of 8 am and 5 pm.		

Aspect	Impact	Environmental Management and Mitigation Measures	Responsible Person	Timeline
Social nuisance	Job seeking and crashes due to differing norms, culture, and values	-Priority of employment should be given to local people, and only if necessary and due to a lack of skills in the area, out-of-area people can be given some of the work. -The locals to be employed during the project phases should be provided with the necessary training of skills required for the project to avoid bringing in many out-of-area employees. -The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations, which results in contracting HIV/AIDS and other sexually related infections. -Out-of-area workers who may be employed (due to their unique work skills) on site should be sensitized to the importance of respecting the local values and norms.	-Construction Contractor -Project Manager	Pre-construction In special cases, during the project phases, depending on the project needs
	Potential increase in the prevalence of HIV and AIDS, as well as other sexually transmitted diseases (STIs).	-The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations, which result in contracting HIV/AIDS and other sexually related infections. -Provision of condoms and sex education through the distribution of pamphlets. These pamphlets can be obtained from local health facilities.	-Construction Contractor -EHS Officer	During site setup and throughout the phases
	Private and Public Property Intrusion and Disturbance, or Damage	-Project workers should be educated on the importance of respecting nearby properties. No intruding on or damaging fences or snaring and killing of livestock. -Any site employees who will be found guilty of intruding on people's privately owned properties should be called in for a disciplinary hearing and/or dealt with as per their employer's code of employment conduct. -Project workers should be advised to respect the community and locals' private properties, values, and norms. -Site workers are not allowed to kill or in any way disturb local animals.	-Construction Contractor	Throughout the phases

ANNEXURE 2: ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES FOR THE PROPOSED SOLID WASTE DUMPSITE IN ONYUULAYE SETTLEMENT

Table 2: Management and mitigation measures for the Planning, Construction, and Operational & Maintenance of the solid waste dumpsite

Aspect	Impact	Environmental Management and Mitigation Measures	Key Performance Indicator (KPI)	Implementation Responsibility
PLANNING AND CONSTRUCTION PHASE				
Dumping site wall design	Utilization of unsuitable materials such as precast	-The dumping site wall should be constructed with a steel pole to ensure that the site is protected from vandalism and unauthorized access – please refer to an example of a better and stronger/vandalism & theft resistance dumping site wall **(Oshakati Town Council site – Figure 1)** -The materials for the wall should be well designed and installed (height-wise).	-The site walls' materials are not meshing wire (vulnerable to vandalism and theft)	-Oshikoto Regional Council
Site infrastructures and services	Lack of necessary infrastructure	-The design should include the security control gate, water supply, ablution facilities, parking areas, and night lighting. -The roads to the site should be properly upgraded and maintenance done regularly.	-All the infrastructures and services are included in the site layout/plan	-Oshikoto Regional Council (Planning & Design Engineer)
Stormwater Management	The stagnation of rainwater and possible overtopping during rainwater (site damage and flooding)	-Stormwater management systems should be designed and incorporated into the dumpsite plan to ensure that the rainwater is collected and diverted to a specific rainwater collection area (point) and not idle on site. -A runoff diversion ditch must be constructed and maintained.	-Stormwater discharge systems are incorporated into the site plan and installed onsite.	-Oshikoto Regional Council -Planning & Design Engineer
Employment opportunities	Conflicts from unfair practices	-The locals should be given preference for work (skilled, semi-skilled, and unskilled, where possible).	-There is a fair recruitment process -Locals are given preference for the work	-Construction Contractor (for

Aspect	Impact	Environmental Management and Mitigation Measures	Key Performance Indicator (KPI)	Implementation Responsibility
	of labour recruitment	-Equal opportunities should be given to women and men, where possible.		the construction phase) -Oshikoto Regional Council (Human Resources Department) for the operational phase
Goods and services procurement	The procurement of goods and services from outsiders over local businesses may lead to conflicts and overlook local suppliers	-The procurement of works for site construction should follow a fair and transparent process. -Procurements for goods and services should be open only to local and Namibian companies with strong local participation. -The business opportunities, such as bulk waste disposal and site maintenance, should be given to local companies	-Project goods and services are procured from nearby towns of Oshikoto Region, if available -Local businesses are considered for procurement opportunities	-Oshikoto Regional Council (Procurement Department)
Water Resources Use	Over-utilization of water resources	-Project water storage tanks should be inspected daily to ensure that there is no leakage, resulting in wasted water. -Water conservation awareness and saving measures training should be provided to all the project workers so that they understand the importance of conserving water and become accountable.	-No water leakages from site water storage tanks -Water is recycled where possible	-EHS Officer/ECO -Construction Contractor

Aspect	Impact	Environmental Management and Mitigation Measures	Key Performance Indicator (KPI)	Implementation Responsibility
Site safety and security	Compromising site security and safety	-A high steel pole wall should be constructed around the site. -A modern security gate and security control point should be installed at the site entrance.	-The site wall and security measures are in place	-Oshikoto Regional Council -Construction Contractor
Soils and water resources	Soils and water resources pollution	-Spill control preventive measures should be in place on site to prevent soil pollution. -For site areas that will be used for the storage of hazardous waste, consider using an HDPE liner or natural clay liner to eliminate the risk of possible leakage/leachate. -Sensitized personnel on the impacts of soil pollution. -Project machines and equipment should be equipped with drip trays to contain possible oil spills. -Polluted soil should be removed immediately and disposed of at an approved and appropriately classified hazardous waste treatment facility. -Refuelling of vehicles should be done off-site. -Washing of equipment contaminated with hydrocarbons, as well as the washing and servicing of vehicles, should take place at a dedicated area off-site.	-No complaints of pollutants on the soils due to project activities -No visible oil spills on the ground or pollution spots. -Sufficient waste containers are provided on-site -Non-permeable materials are used on areas where hydrocarbons and potential pollutants are utilized during construction works.	-Construction Contractor -EHS Officer/ECO
Air Quality	Dust generation, fumes (poor air quality)	-Vehicles should only be driven at the authorized site speed of 40km per hour to avoid dust generation. -The heavy vehicles and fume-generating equipment should not be left idling when not in use. -Avoid heavy trenching during windy times of the day.	-No complaints from the public about vehicle emissions and dust generation. -Visible efforts to curb dust	-EHS Officer/ECO -Construction Contractor

Aspect	Impact	Environmental Management and Mitigation Measures	Key Performance Indicator (KPI)	Implementation Responsibility
Noise	Nuisance	-Noise from operations' vehicles and equipment on the sites should be at acceptable levels. -The construction activities should not be carried out during the night or before 08h00 in the morning and should be carried out during weekdays only. -Working hours for site works should be restricted to between 8 am and 5 pm to avoid noise. -Site workers and contractors should be equipped with PPE such as earplugs to reduce exposure to excessive noise.	-No complaints from local communities, such as neighbours, about excessive noise from the site -Noise protective equipment for workers	-Construction Contractor -EHS Officer/ECO
Road use and safety	Increase in vehicular traffic flow	-The transportation of materials to and from the site should be limited to once a week only. -Ensure that the access roads are frequently maintained and have sufficient road signs. -Drivers should possess valid and appropriate driving licenses and adhere to road safety rules. -Drivers should drive 40km/hour and be on the lookout for people and local animals on the roadsides -Drivers should not be allowed to operate vehicles while under the influence of alcohol.	-No complaints from members of the public regarding vehicular traffic issues related to the project activities. -All vehicle drivers are appropriately licensed and possess valid driving licenses.	-Construction Contractor -EHS Officer/ECO
Soils	Physical soil/land disturbance and loss of topsoil	-The topsoil that was stripped from certain site areas should returned to its initial position, should be returned. -Site soils should not be disturbed if not needed or related to the actual construction works. -All site maintenance trenches should be backfilled, and areas rehabilitated upon completion of works	-No stockpiled soils after completion of works -No new erosion gullies.	-Construction Contractor -EHS Officer/ECO

Aspect	Impact	Environmental Management and Mitigation Measures	Key Performance Indicator (KPI)	Implementation Responsibility
Littering and waste management (general waste and sanitation)	Environmental Pollution	-Personnel should be sensitized to dispose of waste responsibly and not to litter. -Ensure that there are no wastes left or disposed of outside the site. -No waste may be buried on site. -Maintain separate areas for different waste onsite. -Encourage the recycling of waste such as bottles, garden refuse, and plastic by setting up a recycling centre at the dumping site. -Educate people on the importance of re-usable household waste and encourage recycling of waste.	-No visible litter within and around the site area owing to the Project -Provision of sufficient waste storage containers -Waste management awareness	-Construction Contractor
	Wastewater (sewage)	-Ensure that there are sufficient toilets (septic tank system) for the construction phase and flushing toilets for the operational phase (for workers to be stationed at the dumpsite). -Sewage and wastewater generated onsite during construction should be properly contained for transportation to the Town's sewage treatment facility -Open defecation on /around the site is strictly prohibited.	-Adequate toilet and basic ablution facilities on site.	-Construction Contractor
Archaeology and heritage	Accidental disturbance of archaeological or heritage objects	-During construction, the contractor should be sensitized to exercise and recognize Heritage "Chance Finds Procedure (CFP)" – Annexure 3. -Adhere to the provisions of Section 55 of the National Heritage Act if significant heritage and culture features are discovered while conducting site works.	-Preservation of all artefacts and objects that are discovered on and around the project site during earthworks	-Construction Contractor -EHS Officer/ECO

Aspect	Impact	Environmental Management and Mitigation Measures	Key Performance Indicator (KPI)	Implementation Responsibility
		-When removing topsoil and subsoil on the site for site works, the site should be monitored for subsurface archaeological materials.		
OPERATIONAL AND MAINTENANCE PHASE				
EMP implementation and training	Lack of EMP awareness and implications thereof	-EMP training should be provided to all site personnel. -All site personnel should be aware of necessary health, safety, and environmental considerations. -The implementation of this EMP should be monitored. The site should be inspected, and a compliance audit done throughout the project activities (biannually). -Implement the EMP non-compliance penalty system onsite.	-Compliance monitoring is conducted biannually and should be recorded. -The ECC is renewed every 3 years -Bi-annual reports -Records of EMP training conducted.	-EHS Officer/ECO
Site Fire outbreaks	Accidental fire outbreak risks	-Warning signs of ''*No Smoking*'' and ''*No throwing of live cigarettes or firewood inside the dumping site/No open fires*'' should be written (in English and Oshiwambo) and pasted at the dumping site entrance. -The site should be equipped with at least two fire extinguishers at the security gate and should be serviced accordingly. The personnel should be trained on how to use extinguishers (basic fire firefighting skills). -No open fires should be created on-site. -The contact details of fire services should be readily and visibly displayed at the entrance office/security control. -All personnel must be sensitised about responsible fire protection measures and good housekeeping, such as the removal of flammable materials (e.g., rubbish, dry vegetation, and hydrocarbon-soaked soil) onsite.	-No open fires by site personnel or visitors -Fire extinguishers are readily available and up to date with service	-Oshikoto Regional Council -EHS Officer/ECO -Site Operator

Aspect	Impact	Environmental Management and Mitigation Measures	Key Performance Indicator (KPI)	Implementation Responsibility
		-The burning of waste onsite should be done between 8 am and 15h00 to ensure that there is someone onsite to monitor the fire until it is completely put out before leaving the site, i.e., no open fire should be left onsite unattended.		
Site safety and security	Compromising site security and safety	-The site should be equipped with 24-hour security surveillance in case of opportunistic activities such as theft and vandalism.	-The site wall and security measures are in place	-Oshikoto Regional Council -Site Operator
Occupational and community health and safety	Project-related injuries and other health and safety-related issues on personnel and locals	-Project personnel should be inducted provided on the health & safety measures, including the risks of mishandling equipment, materials on site. -The contact details of the ambulance and other extensive health care services should be readily and visibly displayed on-site for the site personnel. -A fully furnished first aid kit should always be on-site, and ensure that 2 or 3 site personnel are trained on administering first aid. -Employees and visitors should be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, or safety glasses (depending on the job undertaken onsite or sites visited, etc) -Heavy vehicles, equipment, and machinery at or to the site should be properly secured to prevent any harm or injury. -An emergency preparedness plan should be compiled, and all personnel appropriately trained. -Personnel should not be allowed to drink alcohol before and during working hours, nor be allowed on site when under the influence of alcohol (leading to health & safety risks).	-Comprehensive health and safety plan for all project activities compiled. -Occupational Health and Safety Personnel -Health and Safety Training -Fully equipped first aid kit onsite -Trained workers to administer first aid	-Oshikoto Regional Council -EHS Officer/ECO -Construction Contractor (during construction) -Site Operator

Aspect	Impact	Environmental Management and Mitigation Measures	Key Performance Indicator (KPI)	Implementation Responsibility
		-The scavenging of waste by community members should be prohibited as certain waste items could pose health and safety risks, such as stumbling on unnoticed broken bottles, rotten food items, chemicals, and other potential unhealthy items contained in waste. -Prohibit the entrance of children under the age of 18 unaccompanied into the dumpsite. The waste collection for re-use and recycling should be supervised and done through designated site workers and following proper procedures.		
Road use and safety	Increase in vehicular traffic flow	-Ensure that the access roads are frequently maintained and have sufficient road signs. -Drivers should possess valid and appropriate driving licenses and adhere to road safety rules. -Drivers should drive 40km/hour and be on the lookout for people and local animals on the roadsides -Drivers should not be allowed to operate vehicles while under the influence of alcohol. -The deliveries of waste to the site should be done during weekdays between the hours of 8 am and 5 pm.	-No complaints from members of the public regarding vehicular traffic issues related to the project activities. -All vehicle drivers are appropriately licensed and possess valid driving licenses.	-Oshikoto Regional Council -EHS Officer/ECO -Site Operator
Littering and waste management (general waste and sanitation)	Environmental Pollution	-Refer to planning and construction measures	-No visible litter within and around the site area owing to the Project -Provision of sufficient waste storage containers -Waste management awareness	-Oshikoto Regional Council -Site Operator -EHS Officer/ECO
	Wastewater (sewage)	-Refer to planning and construction measures	-Adequate toilet and basic ablution facilities on site.	-Oshikoto Regional Council

Aspect	Impact	Environmental Management and Mitigation Measures	Key Performance Indicator (KPI)	Implementation Responsibility
Visual	Visual nuisance due to the waste heap built up	-Consider compacting waste to prevent a buildup of waste heaps onsite. -All the available options to improve the aesthetic of the site should be considered to enhance for a better appeal.	Visual impact is addressed	-Oshikoto Regional Council -Site Operator

AN EXAMPLE OF THE RECOMMENDED WALL OF A DUMPSITE (OSHAKATI TOWN COUNCIL EXAMPLE)

Figure 1. Oshakati Town Council solid waste dumping site entrance and eastern side wall (source: Shagama, 2023)[1]

[1]Shagama, F.N (2023). Comprehensive Environmental Management & Closure Plan (EMCP) & for the Existing Waste Dumping Site in the Rehoboth Town, Hardap Region. Windhoek. MEFT

ANNEXURE 3: CHANCE FINDS PROCEDURE (AFTER KINAHAN, 2020)

Areas of proposed projects are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found during development work. The procedure set out here covers the reporting and management of such finds.

Scope: The "*chance finds*" procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): "*a person who discovers any archaeological …. object ……must as soon as practicable report the discovery to the Council*". The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field. Manager/Supervisor must report the finding to the following competent authorities:

- National Heritage Council of Namibia (Head Office: +264 61 244 375 / Technical Office +264 61 301 903)
- National Museum (+264 61 276 800),
- National Forensic Laboratory (+264 61 240 461).

Archaeological material must NOT be touched. Tempering with the materials is an offence under the heritage act and punishable upon conviction by the law.

Responsibility:

Operator: To exercise due caution if archaeological remains are found

Foreman: To secure site and advise management timeously

Superintendent: To determine safe working boundary and request inspection

Archaeologist: To inspect, identify, advise management, and recover remains

Procedure:

<u>Action by person identifying archaeological or heritage material:</u>

a) If operating machinery or equipment stop work

b) Identify the site with flag tape

c) Determine GPS position if possible

d) Report findings to foreman

Action by foreman

a) Report findings, site location and actions taken to superintendent

b) Cease any works in immediate vicinity

Action by superintendent

a) Visit site and determine whether work can proceed without damage to findings

b) Determine and mark exclusion boundary

c) Site location and details to be added to project GIS for field confirmation by archaeologist

Action by Archaeologist

a) Inspect site and confirm addition to project GIS

b) Advise NHC and request written permission to remove findings from work area

c) Recovery, packaging and labelling of findings for transfer to National Museum

In the event of discovering human remains

a) Actions as above

b) Field inspection by archaeologist to confirm that remains are human

c) Advise and liaise with NHC and Police

d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.