DRAFT

ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN

Construction Of the Purified Effluent Pipeline for The Proposed Housing Development On Erf 5748 Walvis Bay, Next To The Dunes Mall, Walvis Bay, Erongo Region, Namibia

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EAP / Consultant:

ERONGO CONSULTING GROUP

Proponent:

MY IHS HOME .co.na
AFFORDABLE QUALITY HOMES

Postal Box 7143, Swakopmund, 13001, Namibia
+264 (0) 81 878 6676 | info@erongoconsultinggroup.co.za

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1. OVERVIEW

1.1. Project Background

IHS Fund Two (Namibia GP) (Pty) Ltd is planning to construct a housing scheme consisting of approximately 427 sectional title dwelling units near the Dunes Mall on Erf 5748 Walvis Bay. However, due to the Walvis Bay Municipality concerns about mosquitoes, flies, and odour on the subject area, the proponent has contracted the services of the Erongo Consulting Group (ECG), to prepare an Environmental Impact Assessment Scoping report and a Draft Environmental Management Plan for a proposed 2km 315mm closed purified effluent pipeline. This pipeline will only be conditional upon the occupation of the residential buildings.

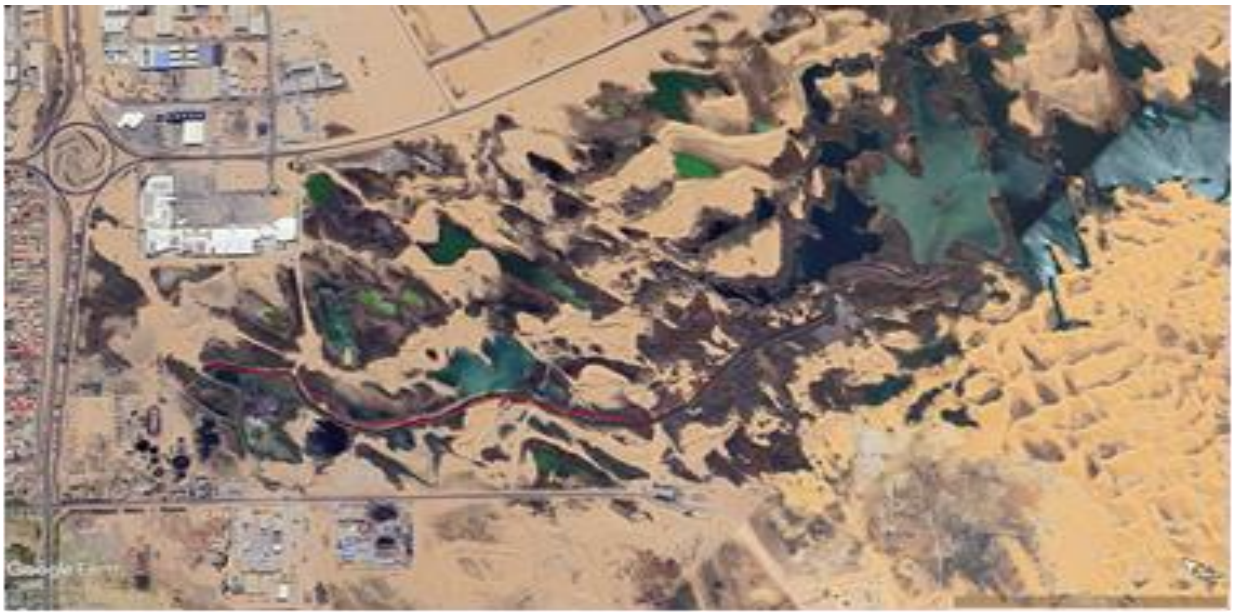
The proposed mitigation measures include laying a closed pipeline from the sewage plant's semi-purified water overflow outlet to the bird sanctuary wetland, diverting excess water further into the dunes, and reducing the odor and fly issues. The project triggers listed activities in accordance with the Environmental Management Act 2007, and an application for Environmental Clearance will be submitted in the form of an Environmental Impact Assessment to the relevant competent authorities and the Ministry of Environment, Forestry, and Tourism in accordance with the Act. The proponent, IHS Fund Two (Namibia GP) (Pty) Ltd, has hired the services of the Erongo Consulting Group to prepare the Environmental and Social Impact Assessment Report (ESIA) for the proposed project.

International Housing Solutions (or IHS) plans to build a new town housing scheme on Erf 5748 Walvis Bay, next to the Dunes Mall. The development will include approximately 427 sectional title dwelling units (two-bedroom units) with ancillary outbuildings (garages), as well as private parks and streets. IHS plans to build and sell townhouses on the local market. Due to the site's location and potential for pests such as flies and mosquitos, including odour, the Walvis Bay Municipality has requested an internal scoping report to assess and reduce the effects of odour, flies, and mosquitoes.

The proponent has consulted with its project engineers and determined that extending the sewage plant's semi-purified effluent pipe approximately two kilometres to discharge into the bird sanctuary wetland instead of the surrounding dunes will address the Municipality's concerns and complaints received from neighbouring residential areas. According to the engineers' advice, the area between the sewage plant and Dunes Mall will eventually dry out, resulting in a relatively odour, fly, and mosquito-free environment once the proposed pipeline is constructed. It should be noted that pipeline construction is classified as a listed activity under the EMA (Environmental Management Act) , a legislation that was passed in 2007.

Figure 1: Locality map of Erf 5748 Walvis Bay (in red) in relation to the Dunes Mall and surrounding environment

Picture 1: The proposed 2.2-kilometre-long purified effluent pipeline route (in red)



1.2. Purpose of the EMP

According to Regulation 8 of the Environmental Management Act's (Act 7 of 2007) and its Regulations (2012), a draft Environmental Management Plan (EMP) is required and should be included as part of the scoping process.

A 'management plan' is defined as follows:

"…a plan that describes how activities that may have significant environments effects on the environment are to be mitigated, controlled and monitored."

One of the most significant outcomes of the EA process is an EMP, which synthesizes all suggested mitigation and monitoring actions and assigns specific responsibilities along with a timeline. It establishes a connection between the effects noted during the Environmental Impact Assessment (EIA) Process and the environmental management needed during the project's actual implementation and operation. A person who violates the terms of this EMP may be subject to imprisonment and/or a fine because an EMP is a legally binding document. This EMP should be updated to reflect changes to the project, the environment, and any findings from compliance monitoring because it is a living document.

The goal of this document is to guide environmental management throughout the proposed development's life-cycle stages of pre-operation (planning and design), construction, operation, and decommissioning.

The following phases are addressed in this EMP:

- **Planning and design (Pre-operation)** - the period, prior to the commencement of the construction phase, during which preliminary legislative and administrative arrangements are carried out in preparation of the proposed activities;
- **Construction** – the period during which construction of the proposed services, roads and associated infrastructure will be ongoing;
- **Operation** - the period during which the proposed development, proposed services, roads, and associated infrastructure will be operational.
- **Decommissioning** – The proposed activities are expected to be a permanent activity and is thus not anticipated to be decommissioned in future. As such the decommissioning impacts for the proposed activity is not discussed.

1.3. Environmental Assessment Practitioner (EAP)

International Housing Solutions (IHS) has engaged the services of Erongo Consulting Group, an independent environmental consultancy firm, to conduct the necessary Environmental Assessment (EA) for the proposed development. This process will involve the preparation of an Environmental Management Plan (EMP), which will be submitted to the Ministry of Environment, Forestry and Tourism, Walvis Municipality, as part of the application for an Environmental Clearance Certificate (ECC). The EMP will serve as a guide for both the Contractors and the Proponent to ensure that the proposed operations are conducted in a manner that minimizes or avoids any potential negative environmental impacts. The scoping EA report will also be submitted as supporting documentation to the ECC application.

1.4. Legal Requirements

According to Section 8 (j) of the EIA Regulations, the EMP must comply with certain standards and must address the potential environmental impacts of the proposed activity on the environment throughout the project's lifespan. The EMP should also include a system to assess the effectiveness of monitoring and management arrangements after their implementation. The Municipality of Walvis Bay has the responsibility to ensure that the proposed activity and the EIA process adhere to the principles of the Environmental

Management Act (EMA), and they must also ensure that any contractors they appoint comply with these standards.

A summary of the legal legislation applicable to the IHS Housing Project has been prepared. This included identifying and outlining the relevant laws, regulations, and policies that the project must comply with. It is essential to ensure that the project adheres to all relevant legal requirements to avoid any legal or financial penalties, as well as negative impacts on the environment and the community. The legal framework for the project should be reviewed regularly to ensure that any changes are taken into account and that the project remains compliant throughout its lifespan.

Table 1: A summary of the legal legislation applicable to the proposed pipeline consruction

LEGISLATION/ GUIDELINE	RELEVANT PROVISIONS	IMPLICATIONS FOR THIS PROJECT
Namibian Constitution First Amendment Act 34 of 1998	- "The State shall actively promote… maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future" (Article 95(l)).	- Ecological sustainability should inform and guide this EA and the proposed development.
Environmental Management Act EMA (No 7 of 2007)	- Requires that projects with significant environmental impact are subject to an environmental assessment process (Section 27). - Details principles that are to guide all EAs.	- The EMA and its regulations should inform and guide this EA process.
Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878)	- Details requirements for public consultation within a given environmental assessment process (GN 30 S21). - Details the requirements for what should be included in a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).	
Forestry Act 12 of 2001 Nature Conservation Ordinance 4 of 1975	- Prohibits the removal of any vegetation within 100 m from a watercourse (Forestry Act S22(1)). - Prohibits the removal of and transport of various protected plant species.	- Even though the Directorate of Forestry has no jurisdiction within townlands, these provisions will be used as a guideline for conservation of vegetation.
Labour Act 11 of 2007	- Details requirements regarding minimum wage and working conditions (S39-47).	- The Walvis Bay Municipality and Proponent should ensure that all contractors involved during the construction, operation and maintenance of the proposed project comply with the provisions of these legal instruments.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety of labourers.	
Public Health Act 36 of 1919	Section 119 states that "no person shall cause a nuisance or shall suffer to exist	

	on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	
National Heritage Act 27 of 2004	Section 48(1) states that "A person may apply to the [National Heritage] Council [NHC] for a permit to carry out works or activities in relation to a protected place or protected object".	Any heritage resources (e.g. human remains etc.) discovered during construction requires a permit from the NHC for relocation.
Burial Place Ordinance 27 of 1966	Prohibits the desecration or disturbance of graves and regulates how bodies may be unearthed or dug up.	Regulates the exhumation of graves.
***Water* Resources Management *Act* 11 of 2013.**	To provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters.	The protection of ground and surface water resources should be a priority. The main threats will most likely be concrete and hydrocarbon spills during construction and hydrocarbon spills during operation and maintenance.
Namibia Water Corporation Act 12 of 1997	To establish the Namibia Water Corporation Limited; to regulate its powers, duties and functions; to provide for a more efficient use and control of water resources; and to provide for incidental matters.	
Urban and Regional Planning Act (No. 5 of 2018).	- Subdivision of land situated in any area to which an approved Town Planning Scheme applies must be consistent with that scheme (S31).	- The proposed use of the project site must be consistent with the Walvis Bay Town Planning Scheme
Road Ordinance 1972 (Ordinance 17 0f 1972)	- Width of proclaimed roads and road reserve boundaries (S3.1) - Control of traffic on urban trunk and main roads (S27.1) - Rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads (S36.1) - Infringements and obstructions on and interference with proclaimed roads. (S37.1) - Distance from proclaimed roads at which fences are erected (S38)	- The limitations applicable on RA proclaimed roads should inform the proposed layout and zonings where applicable.
Walvis Bay Zoning Scheme.	This statutory document provides land use regulations and development.	Land uses and developments should be in accordance with the Walvis Bay Zoning Scheme
Integrated Urban Spatial Development Framework (IUSDF) of Walvis Bay	Provides future land use planning within the Walvis Bay district.	The IUSDF was utilized to see if the proposed activity is in accordance with the future planning of Walvis Bay.
Walvis Bay Climate Strategic Action Plan	Provides action plans on how Town Planning can help mitigate climate change	To promote two-storey developments, reduce urban sprawl and land competition. Encourage EIA studies with regards to rezoning.
Walvis Bay Biodiversity Report	Provides a comprehensive summary and	To ensure that the proposed activity is

of 2008. (WBBR:2008)	map of sensitive Biodiversity Areas and Zoning in the Walvis Bay district.	not located close to any Biodiversity Area or Zoning.
Sustainable Urban Energy Planning: A handbook for cities and towns in developing countries (SUEP:2004)	Provides a comprehensive list and case studies to implement energy saving measures.	Implementing energy-efficiency and carbon mitigation measures. Conserve natural resources with city planning.
Walvis Bay Public Open Space Policy	Sets criteria of parameters for development of parks (POS) in Walvis Bay	

1.5. Assumptions and Limitations

An Environmental Management Plan (EMP) is a critical tool for managing and mitigating the environmental impacts of a project or activity. However, EMPs also have some limitations and assumptions that should be considered:

1.5.1. **Implementation:** EMPs are only effective if they are properly implemented. The success of an EMP depends on the commitment of the project team, stakeholders, and regulatory authorities to follow the plan's recommendations and requirements.

1.5.2. **Uncertainty:** There is always some level of uncertainty when assessing and managing environmental impacts. EMPs are based on assumptions and predictions about the potential impacts of a project. These predictions may not always be accurate due to changes in the project's scope, regulatory requirements, or environmental conditions.

1.5.3. **Incomplete knowledge:** There may be gaps in scientific knowledge or data availability that limit the accuracy of environmental impact assessments. EMPs may need to rely on assumptions or estimates to fill these knowledge gaps, which can affect the plan's effectiveness.

1.5.4. **Limited scope:** EMPs only address the environmental impacts of a specific project or activity. They do not account for broader environmental concerns or cumulative impacts from multiple projects or activities in the same area.

1.5.5. **Changing conditions**: Environmental conditions can change over time, which can affect the effectiveness of an EMP. Changes in weather patterns, natural disasters, or other unforeseen events can alter the environmental impact of a project and require adjustments to the EMP.

Overall, EMPs are essential for managing and mitigating environmental impacts, but their effectiveness depends on proper implementation, accurate predictions, and the ability to adapt to changing conditions.

1.6. Report Structure

The Environmental Management Plan (EMP) outlines the management actions required for the proposed development activities. The EMP covers the following phases of the project:

- **Planning and design (Pre-construction) phase,** which involves making preliminary legislative and administrative arrangements before the construction phase begins.
- **Construction phase**, which involves the actual construction of the proposed services, access roads, and associated infrastructure.
- **Operation phase,** which involves the period during which the development, proposed services, roads, and associated infrastructure will be in operation.

The proposed activities are expected to be permanent and, therefore, will not require decommissioning in the future. As a result, decommissioning impacts for the proposed activity are not discussed in this EMP.

2. ROLES AND RESPONSIBILITIES

EMP Responsibilities refer to the duties and obligations of various stakeholders in implementing and adhering to the Environmental Management Plan (EMP).

The following provides more detailed information on the responsibilities of various stakeholders involved in the implementation of the Environmental Management Plan (EMP):

2.1. Proponent:

The Proponent is responsible for proposing the development activities and ensuring that the EMP is prepared and implemented. The Proponent is accountable for adhering to the environmental requirements set out in the EMP and for ensuring that all stakeholders comply with the EMP. The Proponent must also provide the necessary resources and funding to support the EMP's implementation.

2.2. Environmental Consultants:

Environmental consultants are responsible for conducting the required environmental assessment and compiling the EMP. They must ensure that the EMP is in line with legal requirements and industry standards and that it outlines the necessary mitigation measures. The consultants must also ensure that the EMP is effectively communicated to all stakeholders involved in the project.

2.3. Contractors:

Contractors appointed by the Proponent have a responsibility to ensure that the activities they undertake comply with the EMP and relevant environmental legislation. They must also

ensure that their personnel are trained and aware of the EMP's requirements and that the necessary resources are available to implement the EMP's mitigation measures.

2.4. Municipality of Walvis Bay / Local Authority:

The Municipality has a responsibility to ensure that the proposed development activities and the Environmental Impact Assessment (EIA) process adhere to the principles of the Environmental Management Act (EMA) and other relevant legislation. The Municipality must also ensure that the EMP is in line with the requirements of the EMA and that the necessary resources are available to monitor and enforce the EMP's implementation.

2.5. Relevant Government Departments:

Relevant government departments, such as the Department of Environmental Affairs, have a responsibility to review and approve the EMP and ensure that the proposed development activities comply with all relevant legislation. They must also monitor the implementation of the EMP and ensure that any non-compliance is addressed promptly.

2.6. Community:

The local community has a responsibility to report any concerns or incidents that may arise during the project's lifecycle that may negatively impact the environment. The community must also be provided with relevant information on the EMP and be given opportunities to provide input and feedback on the project's environmental management.

Overall, the successful implementation of the EMP depends on the commitment and cooperation of all stakeholders involved in the project. The responsibilities outlined above help ensure that all parties are aware of their obligations and work together to minimize the environmental impacts of the proposed development activities.

3. ENVIRONMENTAL MANAGEMENT PLAN ACTIONS

3.1. Key Potential environmental impacts to be managed

The potential environmental impacts that need to be managed have been identified for each phase of the project based on the Environmental Assessment (EA) and the Scoping Report. The complete description of these impacts can be found in the Scoping Report and the following presentation.

The potential environmental impacts have been identified for each project phase as follows:

- **Pre-construction phase**: impacts on biodiversity
- **Construction phase**: impacts on biodiversity, surface and groundwater contamination, soil erosion and safety, archaeological, health and safety, dust, noise, waste, and social impacts.

- **Operation phase**: impacts on traffic, soil, surface and groundwater, odour, pests such as mosquitoes and flies, noise, dust, waste, and social impacts such as complaints from nearby residents.

The primary objective of the management actions outlined in the EMP is to prevent potential impacts from occurring wherever possible. In cases where these impacts cannot be avoided, appropriate measures are implemented to minimize their severity.

The recommended management actions to address the potential impacts identified in the Environmental Assessment for the proposed pipeline development are presented in tables organized by project phase: planning and design (pre-construction), construction, and operation and maintenance. It is the responsibility of the Proponent, International Housing Solutions, to carefully review and assess these commitments and acknowledge their commitment to implementing the specific management actions outlined in the tables provided in the following subchapters.

3.2. Phase 1: Planning and Design Management Actions

In the Planning and Design phase of the proposed development, certain management requirements must be met before any on-site activities commence. The following table outlines the specific management actions that must be taken:

The Planning and Design Management Actions outline the requirements to be met before commencing on-site activities. The recommendations include:

- provisions for maximizing the use of local labor in the construction activities, such as sourcing unskilled labor from local communities and promoting gender equality in recruitment.
- Additionally, a Proponent's Representative (PR) should be appointed to act as the on-site implementing agent responsible for ensuring compliance with relevant legislation and this EMP.

3.3 Phase: Construction Phase Management Actions

The management actions for the construction phase during which the construction activities will take place are listed below.

Table 2: Construction phase management actions

ITEM / ISUE	DESCRIPTION	MANAGEMENT ACTIONS	RESPONSIBILITY
Develop a Biodiversity Management Plan (BMP)	A Biodiversity Management Plan (BMP) is crucial in any development project that may affect natural habitats and biodiversity. Its purpose is to reduce negative impacts while maximizing positive impacts on biodiversity. The BMP identifies and assesses potential impacts on biodiversity, develops measures to avoid or reduce those impacts, and outlines procedures for monitoring and evaluating the effectiveness of those measures during the construction and operation phases. Habitat destruction, fragmentation, and degradation can have significant and far-reaching impacts on plant and animal species and ecological processes. The BMP seeks to minimize these impacts by identifying sensitive areas and developing appropriate mitigation measures, such as habitat restoration, re-vegetation, and the use of suitable construction techniques and equipment. The plan also outlines the roles and responsibilities of everyone involved in the plan's implementation. Overall, the BMP is an essential tool for managing the impact of a development on biodiversity.	- Identify and assess potential impacts on biodiversity. - Develop appropriate measures to avoid or minimize negative impacts on biodiversity and maximize positive impacts. - Set procedures for monitoring and evaluating the effectiveness of measures during the construction and operation phases. - Minimise habitat destruction, fragmentation, and degradation. - Identify sensitive areas and develop appropriate mitigation measures. - Implement measures such as habitat restoration, re-vegetation, and creation of new habitats. - Use appropriate construction techniques and equipment to minimize disturbance to natural areas. - Outline roles and responsibilities of all parties involved in the implementation of the plan. - Include contractors, project managers, and regulatory agencies in the plan.	1. Proponent & Contractors
Waste Management	During the construction phase of a project, waste management is a critical aspect that must be properly managed to prevent negative environmental impacts.	The following are some of the management actions that can be implemented to effectively manage waste during the construction phase: - Develop a comprehensive waste management plan that outlines the	Proponent and Contractors

		procedures and measures for handling, storing, transporting, and disposing of waste generated during construction activities. - Ensure that all waste is segregated at the source and disposed of in accordance with applicable laws and regulations. - Provide on-site waste management facilities, such as recycling and composting stations, to reduce the amount of waste sent to landfills. - Encourage the use of environmentally friendly construction materials that produce less waste and are easily recyclable. - Provide regular training and education to construction workers on waste management procedures and practices to ensure their compliance with the waste management plan. - Monitor waste management practices regularly and evaluate their effectiveness in reducing waste and minimizing environmental impacts. - Ensure that contractors and subcontractors adhere to the waste management plan and are responsible for disposing of waste generated from their activities. - Develop a contingency plan for dealing with unexpected waste management issues or emergencies during the construction phase. Implementing effective waste management measures during the construction phase can significantly reduce the negative environmental impacts of a project and contribute to a more sustainable development.	
Develop a Hazardous Waste Management Plan (HWMP)	A Hazardous Waste Management Plan (HWMP) is a document that outlines the procedures for identifying, handling, storing, transporting, and disposing of hazardous waste generated during a construction project. The purpose of the HWMP is to ensure that hazardous waste is managed in a safe and environmentally responsible manner, in compliance with all applicable laws and regulations.	The HWMP typically includes the following components: - **Identification of Hazardous Waste:** The plan should identify the types and quantities of hazardous waste that are likely to be generated during the construction project. This information is used to develop appropriate handling, storage, and disposal procedures. - **Handling and Storage Procedures:** The plan should outline the procedures for safely handling and storing hazardous waste on the construction site. This includes provisions for labelling, packaging, and	- Proponent and Contractors

		segregating hazardous waste from other materials. - **Transportation Procedures**: The plan should specify the procedures for transporting hazardous waste from the construction site to a licensed disposal facility. This includes requirements for proper labelling and packaging of the waste, and for using licensed transporters. - **Disposal Procedures:** The plan should specify the procedures for disposing of hazardous waste at a licensed disposal facility. This includes provisions for selecting an appropriate disposal facility, and for ensuring that the waste is properly handled and disposed of in compliance with all applicable laws and regulations. - **Training Requirements:** The plan should specify the training requirements for personnel involved in handling, storing, transporting, and disposing of hazardous waste. This includes requirements for initial and ongoing training, as well as documentation of training activities. - **Emergency Response Procedures:** The plan should specify the procedures for responding to emergencies involving hazardous waste, including spills, leaks, and other incidents. - Overall, the HWMP is an essential tool for ensuring that hazardous waste is managed safely and responsibly during a construction project. By following the procedures outlined in the plan, construction companies can minimize the risk of environmental harm and ensure compliance with all applicable laws and regulations.	
A Wastewater Management Plan (WWMP)	A Wastewater Management Plan (WWMP) is a critical component of any development project that has the potential to generate wastewater during the construction and operation phases. The purpose of the WWMP is to manage the generation, collection, treatment, and disposal of wastewater in a safe and environmentally sound manner. The WWMP provides a framework for identifying and assessing potential impacts of wastewater generation on the	The WWMP to include the following measures: - Design and construction of an appropriate wastewater treatment system that meets the regulatory requirements and is capable of treating the wastewater generated during the construction and operation phases. - Implementation of best management practices to minimize the generation of wastewater, such as using low-water-consumption equipment and practices. - Regular monitoring of wastewater quality to ensure compliance with	- Proponent and Contractors

	environment, as well as developing appropriate measures to avoid or minimize those impacts. It also sets out procedures for monitoring and evaluating the effectiveness of the measures implemented during the construction and operation phases of the development.	regulatory standards. - Proper handling and disposal of treated wastewater to prevent contamination of surface and groundwater resources. - Emergency response procedures in the event of a wastewater spill or other incident. - The plan also outlines the roles and responsibilities of all parties involved in the implementation of the plan, including contractors, project managers, and regulatory agencies. In summary, the WWMP is an important tool for managing the impact of wastewater generated during the construction and operation phases of a development project. It provides a framework for identifying potential impacts and developing appropriate measures to minimize those impacts, while also providing a mechanism for monitoring and evaluating the effectiveness of those measures over time.	
Shallow wetlands/ groundwater occurrences	Construction activities can have adverse effects on natural resources such as shallow wetlands and groundwater occurrences. It is vital to implement management actions during the construction phase to mitigate these negative impacts. Some of the potential impacts include pollution, soil erosion, and sedimentation caused by construction activities. These changes can affect the water quality and quantity, ultimately impacting the plant and animal species that rely on these resources.	Management actions related to shallow wetlands and groundwater occurrences during the construction phase of a water effluent pipeline project are crucial for minimizing potential impacts on these sensitive ecosystems. Some possible management actions that can be taken include: - Conducting a thorough environmental impact assessment (EIA) to identify potential impacts on shallow wetlands and groundwater, and developing appropriate measures to avoid or mitigate those impacts. - Designing the pipeline route to avoid areas with shallow wetlands and groundwater occurrences as much as possible. - Conducting regular monitoring of groundwater levels and quality during the construction phase, and implementing measures to prevent contamination or damage to wetlands and groundwater systems. - Establishing buffer zones around shallow wetlands and groundwater systems to protect them from construction activities and prevent disturbance.	- Proponent and Contractors

		- Implementing erosion and sediment control measures during construction to prevent sedimentation in wetlands and groundwater systems. - Using low-impact construction techniques, such as directional drilling, to minimize disturbance to wetlands and groundwater systems. - Overall, a proactive and comprehensive approach to managing the impacts of water effluent pipeline construction on shallow wetlands and groundwater is necessary to ensure the protection of these vital ecosystems.	
Soil	During the construction phase of a project, it is important to implement management actions to minimize potential negative impacts on soil. Soil is a critical natural resource that supports plant growth and provides important ecosystem services. Construction activities have the potential to cause soil erosion, compaction, and degradation. These impacts can lead to a loss of soil fertility, a decrease in soil water holding capacity, and a reduction in the ability of the soil to support plant growth. Additionally, construction activities can also result in the introduction of contaminants to the soil, which can have negative impacts on soil health and plant growth.	Here are some management activities/actions that can be implemented during the construction phase to manage soil-related issues: - Conduct a soil assessment prior to construction to identify potential soil issues and determine appropriate management measures. - Implement soil erosion and sediment control measures to prevent soil loss and maintain soil quality during construction. - Minimize soil disturbance by carefully planning the construction activities and avoiding unnecessary grading or excavation. - Implement measures to protect soil from contamination by hazardous substances, such as using appropriate storage and handling procedures for chemicals and fuels. - Implement measures to manage excess soil generated during construction, such as reusing it on site or disposing of it in accordance with applicable regulations. - Monitor soil quality throughout the construction phase and adjust management measures as needed to ensure that soil is protected and maintained. - Develop a soil management plan that outlines the specific management measures to be implemented during the construction phase and assigns responsibilities to different parties involved in the project.	- Proponent and Contractors
Dust & Noise	Construction activities have the potential to cause dust and		- Proponent and

	noise, which can impact both the environment and nearby communities. Dust may result from excavation and earthworks and can cause respiratory issues for humans and animals. Similarly, noise pollution can result in sleep disturbance, hearing loss, and communication interference. To mitigate these negative impacts, it is crucial to take management actions such as utilizing dust suppression techniques, scheduling noisy activities during non-peak hours, and providing noise barriers to protect nearby communities.	During the construction phase of a project, it is important to implement management actions to minimize potential negative impacts on the environment and nearby communities. Two common sources of environmental and social impact during construction are dust and noise. To manage dust and noise, the following actions can be taken: **Dust Management:** - Wetting down areas where dust is generated, such as excavation sites and access roads, to prevent dust from becoming airborne. - Using dust suppression equipment, such as water trucks, on-site to control dust. - Using appropriate vegetation or mulch to stabilize exposed soil areas. - Limiting the speed of vehicles on unpaved roads or tracks to reduce dust generation. **Noise Management:** - Using equipment and vehicles that meet or exceed local noise regulations. - Establishing noise limits for construction activities and monitoring compliance with these limits. - Scheduling noisy activities during appropriate times to minimize disturbance to nearby communities. - Using noise barriers or other noise reduction measures when necessary. By implementing these management actions, the impacts of dust and noise generated during the construction phase can be minimized, thus reducing potential negative effects on the environment and nearby communities.	Contractors
Wetlands	During construction, wetlands can be negatively affected by activities such as excavation and the use of heavy equipment. This can lead to changes in water quality and quantity,	Potential EMP construction phase management actions for wetlands, presented in bullet point format:	- Proponent and Contractors

	impacting the plant and animal species that rely on these ecosystems.	- Identify and map wetland areas before construction begins - Create exclusion zones to prevent equipment from entering wetland areas - Implement erosion and sedimentation controls to minimize disturbance to wetlands - Use appropriate construction techniques and equipment to minimize the impact on wetlands - Implement water diversion or capture systems to prevent pollutants from entering wetlands - Consider creating new wetland areas or restoring degraded wetlands to enhance wetland ecosystems - Monitor wetland health and take corrective action if necessary - Provide training to construction personnel on the importance of wetland protection and management	
Health and Safety	The impact of health and safety issues during the construction phase of a project can be significant, with potential risks including: - Physical harm or injury to workers, contractors, or members of the public - Exposure to hazardous materials, such as asbestos or lead, which can cause respiratory problems and other health issues - Noise pollution, which can lead to hearing loss and interfere with communication - Dust and other airborne particles, which can cause respiratory problems - Vibration, which can cause structural damage to nearby buildings or structures - These impacts can result in delays, increased costs, and legal liabilities, as well as reputational damage for the project and the organization responsible for it. It is important to	- Management actions for health and safety impacts during the construction phase of a project may include: - Conducting hazard assessments and developing risk management plans to identify and address potential safety and health hazards. - Providing appropriate personal protective equipment (PPE) to workers and ensuring that they are trained on its proper use. - Ensuring compliance with relevant safety regulations and standards, including those related to fall protection, electrical safety, and hazardous materials. - Conducting regular safety inspections and audits to identify and address hazards and non-compliance issues. - Establishing clear communication channels for reporting safety concerns and incidents, and addressing them promptly. - Providing adequate first aid and emergency response resources, such as first aid kits, fire extinguishers, and emergency contact information. - Ensuring that workers are properly trained on the safe use of tools and equipment, and that equipment is regularly inspected and	- Proponent and Contractors

	implement appropriate health and safety management actions to minimize these impacts and protect the health and safety of workers, contractors, and members of the public.	maintained. - Providing adequate lighting and signage to ensure safe working conditions. - Implementing traffic management plans to protect workers and the public from construction traffic. Providing regular safety training and education to workers, and encouraging a culture of safety on the construction site.	
labour force	During the construction phase of a project, the management of the labour force is an important consideration to ensure the successful completion of the project and to minimize negative impacts on the environment and the community. Some potential impacts associated with the labour force during construction include noise pollution, air pollution, and the potential for accidents or injuries. Additionally, there may be concerns about fair labour practices, worker health and safety, and the potential for exploitation of vulnerable populations.	Here are some management actions that could be taken to provide employment opportunities for the local labour force during the construction phase of a project: - Develop a hiring strategy that prioritizes local labor, including working with local labor unions or community organizations to identify and recruit workers. - Provide training and apprenticeship programs for local workers to help build their skills and improve their job prospects. - Establish a fair and transparent hiring process that includes job postings, application and interview processes, and selection criteria. - Ensure that job opportunities are advertised and made accessible to all members of the local community, including women, minorities, and other underrepresented groups. - Provide competitive wages and benefits packages to attract and retain skilled workers. - Establish partnerships with local educational institutions to create job pathways and training programs that align with the needs of the construction industry. - Work with local government and community organizations to identify and address any barriers that may prevent local workers from accessing job opportunities, such as transportation or childcare issues.	- Proponent and Contractors

		By implementing these management actions, projects can provide meaningful employment opportunities for the local labor force, support the local economy, and promote social sustainability.	
Groundwater Contamination	During the construction phase of a project, there is a risk of groundwater contamination due to activities such as excavation, drilling, and the use of heavy equipment. Groundwater contamination can have serious environmental and health impacts, including the contamination of drinking water supplies.	To prevent groundwater contamination, it is important to implement management actions during the construction phase. These may include: - Conducting a site assessment to identify any potential sources of contamination. - Implementing measures to prevent spills and leaks, such as the use of secondary containment and drip trays. - Properly storing and handling hazardous materials and waste. - Implementing erosion and sediment control measures to prevent soil and sediment from entering groundwater. - Implementing measures to minimize dust, such as using water trucks to dampen areas of disturbance. - Monitoring groundwater quality during and after construction to detect any changes or contamination. - Providing training to workers on proper handling and disposal of materials to prevent contamination. - Ensuring compliance with relevant regulations and standards related to groundwater protection. By implementing these management actions, the risk of groundwater contamination can be minimized, helping to protect the environment and public health.	- Proponent and Contractors
Visual impact and rehabilitation	Visual impact and rehabilitation are important considerations during the construction phase of a project. Construction activities can have significant visual impacts on the surrounding environment, including changes to the landscape, destruction of natural features, and the introduction of new structures or equipment.	Sure, here are some management actions that can be taken to address visual impact and rehabilitation during the construction phase: - Conduct a visual impact assessment to identify areas that may be impacted by construction activities and develop a plan to minimize visual impacts. - Implement screening measures such as fencing, barriers, and landscaping to mitigate visual impacts and improve aesthetics.	- Proponent and Contractors

		- Implement a soil erosion and sediment control plan to minimize impacts on nearby water bodies and prevent sedimentation that can degrade visual quality. - Establish a rehabilitation plan that outlines measures to restore disturbed areas to their pre-construction condition or to an improved state, including re-vegetation, grading, and other erosion control measures. - Use low-impact construction techniques and equipment to minimize the extent of site disturbance and preserve natural features. - Monitor construction activities regularly to ensure compliance with visual impact and rehabilitation management plans and regulations. - Engage with the local community and stakeholders to obtain feedback on visual impacts and rehabilitation efforts and to address any concerns that may arise. These actions can help to minimize negative visual impacts and support the long-term rehabilitation of impacted areas.	
Topsoil	During the construction phase of a project, the removal of topsoil can have negative impacts on soil quality and the ability of the land to support plant growth.	minimize these impacts, it is important to implement topsoil management actions, including: - Identifying areas of high-quality topsoil and prioritizing their protection - Removing topsoil only from areas where it is absolutely necessary for construction activities - Stockpiling topsoil in a designated area for later use in site rehabilitation - Implementing measures to prevent erosion and protect exposed soil during construction activities - Reusing topsoil on-site for landscaping or other purposes wherever possible - Conducting soil testing to assess soil quality before and after construction activities and to inform any necessary remediation	- Proponent and Contractors

		efforts. - These actions can help minimize the negative impacts of topsoil removal and support the long-term health and sustainability of the land.	
Site access	Site access is an important aspect of the construction phase of any project. To ensure that construction activities do not impact the local community or the environment, it is important to implement effective site access management strategies	Management actions include: - Develop a site access plan that outlines the routes for construction vehicles and the areas where vehicles are allowed to park. - Clearly marking the construction site with signage to ensure that only authorized personnel and vehicles are allowed access. - Implementing speed limits and traffic control measures to ensure the safety of workers and the public. - Ensuring that construction vehicles are properly maintained to minimize noise and emissions. - Establishing a system for tracking and monitoring the movement of construction vehicles to ensure compliance with the site access plan. By implementing effective site access management strategies, the construction phase of the project can be carried out safely and efficiently, with minimal impact on the local community and environment.	- Proponent and Contractors
Construction Equipment Storage and Repairs	Improper storage and maintenance of construction equipment can have various negative impacts on the environment and surrounding communities. For example: **Soil and groundwater contamination:** If equipment is not stored properly, fuel, oil, and other chemicals may leak into the soil, leading to soil and groundwater contamination. **Air pollution:** If equipment is not maintained properly, it can release harmful emissions into the air, contributing to air pollution. **Noise pollution**: Equipment repairs and maintenance can generate loud noises that can disturb nearby communities and wildlife. **Aesthetics:** The presence of construction equipment that is not properly stored can negatively impact the aesthetics of the area	To minimize these impacts, it is important to implement proper construction equipment storage and maintenance practices. This may include: - **Establishing designated storage areas:** These areas should be located away from sensitive areas and be designed to prevent fuel and chemical leaks from entering the soil or groundwater. - **Implementing leak prevention measures**: This may include installing secondary containment systems and conducting regular inspections and maintenance to prevent leaks. - **Conducting regular equipment maintenance:** Regular equipment maintenance can help prevent emissions and noise pollution. - **Implementing noise control measures:** This may include conducting repairs during specified hours and using sound barriers or mufflers. Overall, proper construction equipment storage and maintenance are	Proponent and Contractors

	and reduce property values.	important for minimizing negative impacts on the environment and surrounding communities.	
Dismantling Of Equipment After Construction	The dismantling of equipment after construction is an important aspect of the construction phase of a project, as it can impact the environment and the local community.	The following are some management actions that can be taken to minimize these impacts: - Develop a plan for the dismantling of equipment that includes procedures for the safe removal of equipment and the disposal of any hazardous materials. - Ensure that all dismantling activities are carried out by trained personnel who are equipped with appropriate personal protective equipment (PPE). - Ensure that all dismantled equipment is properly cleaned and inspected before it is transported off-site. - Implement measures to prevent soil and water contamination during the dismantling process, such as the use of drip trays and containment barriers. - Develop a plan for the reuse or recycling of dismantled equipment, wherever possible, to reduce waste and minimize the environmental impact. - Conduct regular inspections of the dismantling area to ensure compliance with environmental and safety regulations, and to identify any potential issues. - Communicate with local communities about the dismantling process and the measures being taken to minimize impacts on the environment and the community. By implementing these management actions, the impacts of equipment dismantling can be minimized, and the environment and local community can be protected.	Proponent and Contractors
Stakeholder Communication	The impact of effective stakeholder communication during the construction phase of a project is that it can improve project outcomes and reduce potential negative impacts. It can also enhance relationships between project stakeholders and lead to	- Establish a communication plan that includes regular updates to stakeholders, such as nearby residents, local authorities, and relevant organizations, on the progress of the project and any potential impacts that may occur during construction.	Proponent / Contractors / Stakeholders

	increased stakeholder satisfaction and support. Conversely, poor communication can lead to stakeholder dissatisfaction, delays, and cost overruns, which can negatively impact project outcomes and the project proponent's reputation.	- Provide stakeholders with contact information for the project team so that they can report any concerns or issues that arise during construction. - Hold regular meetings with stakeholders to discuss project updates, address concerns, and gather feedback. - Use various communication methods, such as email, social media, newsletters, and public notices, to ensure that stakeholders are informed of the project and any changes that may occur. - Establish a complaint management system to address and resolve any complaints or issues raised by stakeholders in a timely manner.	

3.4 Phase 4: Operational Phase Management Actions

The table below presents the management action for operational phase.

Table 3: Operational phase management actions

Item	Description	Management Actions	RESPONSIBILITY
EMP training	EMP training is an essential component of EMP Construction Phase Management Actions. It is important to ensure that all workers, contractors, and subcontractors involved in the project are adequately trained in the EMP and the specific management actions that are required for the construction phase.	- The following are some management actions that can be taken to ensure effective EMP training: - Develop an EMP training program that outlines the specific management actions and requirements for the construction phase. - Ensure that all workers, contractors, and subcontractors receive training on the EMP and the specific management actions that apply to their work. - Provide regular refresher training to ensure that workers are aware of any updates or changes to the EMP. - Ensure that workers are trained on the safe use of equipment and materials, as well as any specific hazards or risks associated with their work. - Provide training on emergency response procedures, including the appropriate response to spills or other incidents that may impact the environment. - Document all training and maintain records to demonstrate compliance with EMP requirements. - By implementing effective EMP training, workers can be better equipped to carry out their work in a way that minimizes negative impacts on the environment and promotes sustainability.	Proponent / Contractors
Water Usage	During the operational phase of a project, water usage is an important aspect to consider in terms of environmental impact and sustainability.	- The following are some management actions that can be taken to minimize the impact of water usage during the operational phase: - Identify the sources of water required and determine whether	Proponent / Contractors

		alternative sources are available, such as recycled water or rainwater harvesting. - Implement measures to reduce water usage, such as using water-efficient equipment and practices, recycling water, and using non-potable water where appropriate. - Monitor and track water usage to identify areas where improvements can be made and adjust practices accordingly. - Implement erosion and sediment control measures to prevent water pollution and protect water quality. - Provide training and education to construction personnel on water conservation practices and the importance of protecting water resources. - Develop a contingency plan for water shortages - By implementing these management actions, construction projects can minimize the impact of water usage and promote sustainable practices.	
Surface and groundwater contamination	Surface and groundwater contamination can occur during the construction phase of a project, particularly when hazardous materials are used or when spills and leaks occur. These contaminants can negatively impact water quality and pose a risk to human and environmental health.	To minimize the risk of surface and groundwater contamination, it is important to implement management actions during the construction phase. These may include: - Implementing spill prevention and response plans, which outline procedures for preventing and responding to spills and leaks of hazardous materials. - Using non-hazardous materials whenever possible, and ensuring that hazardous materials are stored and handled properly. - Implementing erosion and sediment control measures to prevent soil erosion and the transport of sediment to nearby waterways. - Monitoring water quality at construction sites, and implementing measures to treat or contain any contaminated water. - Implementing best management practices for construction activities, such as using proper drainage systems and avoiding activities that can cause soil disturbance. - Providing training to workers on the proper handling and storage of	Proponent / Contractors

		hazardous materials, spill prevention and response, and other relevant topics. Overall, the key to managing surface and groundwater contamination during the construction phase is to be proactive and implement measures to prevent contamination before it occurs. This requires careful planning and ongoing monitoring to ensure that all activities are conducted in a way that minimizes the risk of contamination.	
Aesthetics	During the operational phase of a project, aesthetics can be impacted by various activities, including excavation, earthworks, and the use of heavy equipment, which can result in the disturbance of natural landscapes and visual pollution.	To minimize these impacts, it is important to implement aesthetic management actions during the operational phase. This may include creating visual barriers to hide construction activities, using appropriate colors and materials to blend in with the surrounding environment, and minimizing the height and footprint of structures. 2. Conduct a visual impact assessment to identify potential aesthetic impacts of the construction phase 3. Develop a landscaping plan to mitigate negative aesthetic impacts and enhance the visual appeal of the site 4. Consider the use of natural or indigenous vegetation in the landscaping plan to blend with the surrounding environment 5. Install temporary fencing or barriers to screen construction activities from public view 6. Minimize the use of brightly colored or reflective materials that may detract from the surrounding landscape 7. Ensure that all construction equipment, materials, and waste are stored in a neat and orderly manner to reduce visual clutter and maintain site aesthetics 8. Regularly clean and maintain equipment and vehicles to reduce visual pollution from dirt and debris 9. Consider the use of public art or other design elements to enhance the visual appeal of the site and promote community engagement with the project.	10.

Waste and Environmental Pollution	During the operation phase of a project, there are various potential impacts on waste and environmental pollution that must be managed.	To manage waste and prevent environmental pollution during the operation phase, the following management actions can be taken: 11. **Waste management plan:** Develop and implement a waste management plan that outlines how waste will be handled, stored, and disposed of. The plan should include procedures for waste reduction, reuse, and recycling, as well as for the safe and proper disposal of any hazardous waste. 12. **Regular waste audits:** Conduct regular waste audits to track the types and quantities of waste being generated, and identify opportunities for waste reduction and recycling. 13. **Pollution prevention measures:** Implement pollution prevention measures, such as spill response plans, stormwater management plans, and air quality management plans, to minimize the risk of environmental pollution. 14. **Compliance monitoring:** Monitor compliance with relevant environmental regulations and standards, and take corrective action as necessary. 15. **Employee training:** Provide training to employees on proper waste handling and disposal procedures, as well as on the importance of pollution prevention. 16. **Community engagement**: Engage with local communities to raise awareness about waste management and pollution prevention, and to address any concerns or complaints related to project activities. Overall, effective waste management and pollution prevention measures are essential for minimizing the environmental impact of a project during the operation phase.	Proponent / Contractors
Hazardous waste	Hazardous waste is a type of waste that is potentially harmful to human health and the environment. In the operation phase of a project, it is important to manage hazardous waste in a responsible and safe manner.	Some management actions that can be taken to address hazardous waste during the operation phase include: - **Identify hazardous waste:** Conduct a survey to identify all hazardous waste generated by the project. - **Proper handling and storage:** Ensure that hazardous waste is properly handled, stored, labeled, and transported in accordance with relevant	Proponent / Contractors

		regulations and standards. - **Hazardous waste minimization:** Implement measures to minimize the generation of hazardous waste, such as reducing the use of hazardous materials, recycling, or reusing materials. - **Training and education:** Provide training and education to employees and contractors on proper handling, storage, and disposal of hazardous waste. - **Emergency response plan:** Develop an emergency response plan that outlines procedures for responding to hazardous waste spills or other incidents. - **Regular inspections and audits:** Conduct regular inspections and audits of hazardous waste management practices to ensure compliance with regulations and standards. - **Disposal:** Ensure that hazardous waste is disposed of at authorized facilities and in compliance with all applicable regulations. Overall, the proper management of hazardous waste during the operation phase is critical for protecting human health and the environment.	
Electricity	The operation phase of a pipeline project involves the transportation of fluids or gases through the pipeline, which requires a source of energy to power the pumping stations. In many cases, this energy source is electricity, which can have environmental impacts such as greenhouse gas emissions and the consumption of non-renewable resources.	To manage the impacts of electricity usage during the operation phase of a pipeline project, some possible management actions include: - Evaluating alternative energy sources such as renewable energy (e.g. solar, wind) or low-emission sources (e.g. natural gas) to reduce greenhouse gas emissions and environmental impacts. - Improving energy efficiency of the pipeline pumping stations by implementing measures such as energy-efficient motors, variable speed drives, and optimized pumping schedules. - Implementing a monitoring and reporting system to track electricity usage and greenhouse gas emissions, and setting targets for reducing energy consumption and emissions over time. - Implementing best practices for the management of hazardous materials and wastes associated with electricity generation, such as safe storage, handling, and disposal of materials - Developing emergency response plans to address potential	Proponent / Contractors

		environmental incidents related to electricity generation and transmission, such as spills or leaks of hazardous materials. Overall, effective management of electricity usage during the operation phase of a pipeline project can help to minimize environmental impacts and promote the sustainability of the project.	
Pipeline leakages	Pipeline leakages can have significant impacts on the environment and human health. The release of hazardous substances from the pipeline can contaminate soil, surface water, and groundwater. The effects of a pipeline leakage can be long-lasting and may require costly and complex remediation efforts to restore the affected area. In addition, a pipeline leakage can result in significant financial losses for the company responsible for the pipeline, as well as legal and reputational damage.	To manage pipeline leakages during the operation phase of a project, the following management actions can be taken: - Regular inspections and maintenance of the pipeline to identify and address any potential leaks or damage. - Implementing a leak detection system, such as pressure sensors or flow meters, to quickly detect any leaks. - Establishing an emergency response plan in case of a leak, including procedures for containment, clean-up, and notification of appropriate authorities. - Providing training to personnel on the safe handling of pipeline materials, including proper shutdown procedures in case of a leak. - Regular monitoring of water and soil quality near the pipeline to detect any signs of contamination. - Using corrosion-resistant materials for the pipeline and ensuring appropriate coating and cathodic protection to prevent corrosion and degradation. By implementing these management actions, the impact of pipeline leakages on the environment can be minimized, and potential hazards to human health can be avoided.	Proponent / Contractors
Land Use Changes	During the operation phase of a project, land use changes can occur as a result of activities such as construction and operation of infrastructure, changes in vegetation, and alteration of natural drainage patterns. These changes can have a range of impacts on the environment, including soil erosion, water quality degradation, and loss of habitat for plant and animal species.	To mitigate these impacts, the following EMP operation phase management actions can be taken: - Regular monitoring and assessment of land use changes to identify any potential negative impacts. - Implementing measures to minimize land use changes, such as avoiding the expansion of project activities beyond the original footprint.	Proponent / Contractors

		- Developing and implementing a land use plan that considers the needs of local communities and the environment. - Engaging with local communities to ensure their participation and input in the land use planning process. - Ensuring compliance with relevant regulations and standards for land use, including zoning and land use restrictions. - Conducting regular environmental and social impact assessments to identify and address any negative impacts on the environment and surrounding communities. Overall, effective management of land use changes during the operation phase can help to minimize negative impacts and ensure the long-term sustainability of the project.	
Stakeholder Communication	The impact of stakeholder communication during the construction phase can be significant in terms of building trust and maintaining good relationships with stakeholders such as the local community, regulatory bodies, and other interested parties. Effective communication can help to address concerns and mitigate negative impacts associated with the construction activities, as well as promote the benefits of the project. Poor communication or lack of communication, on the other hand, can lead to misunderstandings, mistrust, and even delays or legal issues. Therefore, it is crucial to have a comprehensive stakeholder communication plan in place during the construction phase of any project.	- Establish a communication plan that includes regular updates to stakeholders, such as nearby residents, local authorities, and relevant organizations, on the operations of the effluent water pipeline. - Provide stakeholders with contact information for the project team so that they can report any concerns or issues that arise during operation. - Hold regular meetings with stakeholders to discuss project updates, address concerns, and gather feedback. - Use various communication methods, such as email, social media, newsletters, and public notices, to ensure that stakeholders are informed of the project and any changes that may occur. - Establish a complaint management system to address and resolve any complaints or issues raised by stakeholders in a timely manner.	Proponent / Contractors / Stakeholders

4. EMP COMPLIANCE MONITORING

EMP compliance monitoring is an important part of ensuring that the environmental and social impacts of a construction project are managed and mitigated effectively. The following is a detailed description of the various aspects of EMP compliance monitoring that should be considered for the construction of the purified effluent pipeline for the proposed housing development on Erf 5748 Walvis Bay, in the Erongo Region of Namibia:

4.1. Regulatory compliance:

The project should comply with all relevant regulatory requirements and permits, including those related to water use, air quality, waste management, and environmental impact assessments. Compliance monitoring should be conducted regularly to ensure that the project is meeting these requirements.

4.2. Environmental impact monitoring:

Environmental impact monitoring should be conducted to assess the impacts of the construction project on the surrounding environment. This should include monitoring of air quality, noise levels, water quality, and other relevant indicators.

4.3. **Social impact monitoring:**

Social impact monitoring should be conducted to assess the impacts of the construction project on the local community. This should include monitoring of community health, safety, and well-being, as well as the socio-economic impacts of the project on the local community.

4.4. **Construction site monitoring:**

Construction site monitoring should be conducted to ensure that the construction project is being carried out in accordance with the EMP. This should include monitoring of construction activities, materials, and equipment, as well as the implementation of mitigation measures to address environmental and social impacts.

4.5. **Reporting and communication:**

Regular reporting and communication should be established between the project team and stakeholders, including the local community, regulatory agencies, and other interested parties. This should include the provision of regular updates on project progress, compliance monitoring results, and any mitigation measures that have been implemented.

4 **Review and evaluation:**

Regular review and evaluation of the EMP should be conducted to assess its effectiveness in managing environmental and social impacts. This should include identifying any areas for improvement and implementing changes to the EMP as necessary to ensure that it remains effective throughout the construction phase of the project.

5 CONCLUSIONS

In conclusion, the construction of the purified effluent pipeline for the proposed housing development on Erf 5748 Walvis Bay, Walvis Bay, Erongo Region, Namibia, requires a comprehensive Environmental and Social Management Plan (EMP) to minimize negative impacts on the environment and communities.

During the construction phase, various management actions need to be implemented to minimize impacts on wetlands, groundwater, surface water, visual aesthetics, and waste management, among others. These actions include identifying and mapping wetland areas, creating exclusion zones, implementing erosion and sedimentation control measures, and providing training to workers.

During the operation phase, management actions such as monitoring the pipeline for leakages, managing hazardous waste, and ensuring compliance with environmental regulations are essential. Additionally, the social impacts of the pipeline on local communities need to be considered, and measures taken to minimize negative impacts.

Finally, compliance monitoring is crucial to ensure that the EMP is being implemented effectively and that any issues that arise are addressed promptly. Regular monitoring and reporting will help to ensure the long-term sustainability of the project and mitigate negative impacts on the environment and communities.