THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

Dar es Salaam Water supply & Sanitation Authority

DAWASA Building, Dunga/Malaga Street, Mwananyamala Area

P. O. Box 1573, Dar es Salaam. TANZANIA.

Tel. +25522276006/15; Fax: +255222762480; E-mail: dawasaceo@dawasa.co.tz

IMPROVED DETAILED PROJECT BRIEF FOR THE PROPOSED CONSTRUCTION OF FEACAL SLUDGE TREATMENT PLANT TO BE CONSTRUCTED AT MITAMBA AREA, LUMUMBA MTAA, PANGANI WARD KIBAHA MUNICIPAL COUNCIL, PWANI REGION

Lead Consultant:

Prof. Rubhera RAM Mato (PhD), CEng. (T), Reg. EIA Expert

Mobile: +255754898592; E-Mail: rubheramato@gmail.com

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We would like to express sincere appreciation to all institutions, stakeholders, and individuals who contributed to the successful preparation of this Environmental and Social Impact Assessment (ESIA) for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba Area, Lumumba Mtaa, Pangani Ward, within Kibaha Town Council, Pwani Region.

Special thanks are extended to Kibaha Municipal Council for their cooperation, logistical support, and valuable information provided during field visits and stakeholder consultations. We also acknowledges the important role played by sector institutions for their technical support and prompt assistance during the study process.

We are grateful to the leadership and community members of Lumumba Mtaa and Pangani Ward for their cooperation, constructive participation, and willingness to provide local information during the consultation meetings and field surveys.

STUDY TEAM

NAME	POSITION	NEMC Reg. No.	SIGNATURE
Prof. Rubhera RAM Mato	Environmentalist and ESIA Team Leader	NEMC/EIA/0092	
Mr. Melkizedeck Stephano	Environmentalist	Registration on Progress	

Executive Summary

Background

The Government of the United Republic of Tanzania (GoT) through the Dar es Salaam Water and Sewerage Authority (DAWASA) under the Ministry of Water intends to implement an Off Grid Sanitation Project (OGSP) to serve peri-urban areas not connected to the central sewerage system. DAWASA has received financing from the International Development Association (IDA) in the form of a credit to implement the project. Prior to implementing the project, the law in Tanzania requires an Environmental Impact Assessment to be conducted and approved by relevant authority. In order to comply with the law in Tanzania, the DAWASA intends to apply a portion of the proceeds of the credit to eligible payments for consulting services for Preparation of Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) Report for construction of off grid sanitation projects.

Kibaha, located in Pwani Region of Tanzania, has experienced significant transformation over the past two decades. Formerly a modest township with scattered rural characteristics, Kibaha has evolved rapidly, both demographically and economically, owing largely to its strategic proximity to Dar es Salaam, the country's largest commercial city. Situated approximately 40 kilometers west of Dar es Salaam along the major Morogoro Highway, Kibaha has increasingly become a residential, commercial, and in In response to the persistent environmental and public health challenges arising from inadequate sanitation in urban and peri-urban areas, the Government of Tanzania, through the Ministry of Water and in collaboration with the Dar es Salaam Water and Sewerage Authority (DAWASA), is implementing the Off-grid Sanitation Project. This initiative is financed by the World Bank and aims to provide improved sanitation infrastructure to underserved communities that are not connected to the central sewerage network. The proposed Off-grid Sanitation Project in Kibaha Municipal is the construction of a Fecal Sludge Treatment Plant (FSTP) in Mitamba area, Lumumba Mtaa, Pangani Ward within Kibaha Town Council. The facility will serve as a critical intervention to:

- Improve urban sanitation services through safe collection, transport, treatment, and disposal of fecal sludge.
- Prevent environmental contamination.
- Support the sustainable urban development of Kibaha as it aligns with national development frameworks and the World Bank's safeguard standards.

The EIA is prepared in line with World Bank Safeguard Policies requirements, Tanzanian Environmental Management Act (2004), and other relevant legal instruments. The document outlines mitigation, monitoring, and institutional arrangements for managing potential impacts.

Nature of the Project

The proposed project concerns construction of Faecal Sludge Treatment Plant FSTP for public use at Mitamba area, Lumumba Mtaa, Pangani ward, Kibaha Municipality. The nature of the project enhances environmental protection through proper handling and

disposal of domestic sewage. According to First Schedule of the EIA and Audit Regulations (Amended) of 2018, the nature of the project entails no significant impacts. The project falls under Type B2 category, which according to the regulations are "medium-scale activities and enterprises that require registration but shall not require Environmental Impact Assessment. Further, the projects shall not require screening and scoping, rather, the Project Brief shall be examined and issued with an Environmental Impact Assessment Certificate.

Scope of the ESMP

This Environmental and Social Impact Assessment (ESIA) for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba area, Lumumba Mtaa, Pangani Ward, Kibaha defines clear temporal, spatial, and institutional boundaries to guide the assessment of potential impacts. Spatially, the study covers the entire project footprint, including treatment units, access roads, drainage systems, and ancillary facilities, as well as adjacent areas that may be directly or indirectly affected by construction activities, traffic movements, odour emissions, noise, dust, and surface runoff.

PROJECT DESCRIPTION

Project Location and Justification for Site Selection

The proposed Fecal Sludge Treatment Plant (FSTP) will be located at Mitamba area, within Lumumba Mtaa, in Pangani Ward, which is part of Kibaha Municipal Council, in the Pwani Region of the United Republic of Tanzania approximately 13.7kilometers from the Kibaha Town center. The selected site lies on the outskirts of Kibaha town and is strategically positioned to serve urban and peri-urban settlements within the municipality. The area is accessible via existing local access roads that connect to the main highway (Morogoro Road – A7), which facilitates the movement of fecal sludge transportation trucks and construction materials. The site is situated in a semi-urban environment characterized by scattered residential housing, open spaces, and low-density development.

Accessibility

The proposed FSTP project site is, approximately 13.7 km from Kibaha Town center and accessible via the Morogoro highway. From the main highway, access to the site is through a local feeder road that connects the settlement to the main road network.

Currently, the access road to the project site is a murram (earth) road, which is passable during dry seasons but may require improvement during the rainy season to allow smooth transportation of construction materials, desludging trucks, and maintenance vehicles. Temporary upgrading, such as graveling or grading, is recommended during the construction phase to ensure uninterrupted site access.

Land Ownership

The land allocated for the FSTP project and/or any centralized collection infrastructure has been officially allocated to DAWASA by the Kibaha Municipal Council. A formal allocation letter has been issued and attached as Appendix i, confirming that the area is public land under the jurisdiction of the Municipal Council, and is exempt from

encumbrances or private claims. This provision ensures smooth project implementation immediately related to land tenure conflicts.

Project Design

The proposed technology and construction design follows the objective to execute an engineering design of fecal sludge management facility (one in number at the stated site) which will be simple, cost effective/efficient, easy to operate and maintain performance standards which conform to NEMC. The proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba in Kibaha Town Council has been designed with an operational lifespan of twenty (20) years, taking into account projected population growth, increasing fecal sludge generation rates, urban expansion, and anticipated climate variability within the service area.

Process Description and project Components

The main treatment technologies that are adopted in the design of FSTP are based on solid-liquid separation, stabilization, dewatering of sludge and pathogen removal. The separated liquid component is also treated to meet discharge standards. The faecal sludge from different parts of the city will be conveyed to the FSTP through manual or automated desludging trucks. The treatment modules for solid components are: Feeding (receiving) Tank (FT) with screen chamber, Settling-Thickening Tank (ST), Anaerobic Stabilization Reactor (ASR), Unplanted Drying Bed (UPDB). Treatment modules for liquid components are: Anaerobic Baffled Reactor (ABR), Settler, Constructed Wetland (CW) and Polishing pond. The treated water from the polishing pond will also be re-used for cleaning of the FSTP facilities.

Project phases and Activities

The proposed project entails the construction and operation of a decentralized Fecal Sludge Treatment Plant (FSTP) that will safely manage sludge collected from pit latrines and septic tanks within Kibaha Town and its surrounding areas. The plant will be designed to handle an estimated capacity of 220m^3 of sludge per day, more details are presented in Chapter 2 of detailed Project brief.

Utilities

Wastewater Generation: Wastewater generation was estimated basing on the per capita consumption of water supply of which 85% percent is converted into wastewater. However considering the design specifications of the proposed FSTP the amount of wastewater that will be generated after the whole process is estimated to be 75,746m^3/Year (Design report, 2025). The treated wastewater will be discharge in the nearby stream.

Labour: The proposed Fecal Sludge Treatment Plant (FSTP) project will employ different categories of manpower during its phases. During the construction phase, the project is expected to employ approximately 40–50 workers, including skilled, semi-skilled, and unskilled labour.

Electricity: The main source of electricity is from TANESCO and the estimated power consumption per month is about 1,000 units. However, there is a standby generator with 30KVA as an alternative source of power during power cut off.

POLICIES, LEGISLATION AND INSTITUTIONAL ASPECT

INTRODUCTION

According to the fundamental principles of environment, any developmental activities of this nature such as construction of Faecal Sludge Treatment Plant would have socio-economic and somehow environmental impacts that must be addressed and governed in order to serve public interest and sustainable development. Given the many existing and developing environmental laws, regulations and standards in Tanzania, it is worth considering resorting to constitutional provisions to protect and manage the environment. With increasing environmental awareness in recent decades, the environment has become a higher political priority and many constitutions now expressly guarantee a 'right to a healthy environment', as well as the procedural rights necessary to implement and enforce the substantive rights granted. The public or national interest in this aspect is addressed through government Policies and regulated by Principal Acts and Regulations. The implementation of the proposed project shall touch various sectors; therefore, the developer has to comply with number of cross-sectorial policies and legislations relevant to this project. Also, the listed institutions involved in environmental management for the project is included in this chapter.

Relevant Policies

- National Environment Policy 2021
- National Land Policy of 1997
- Construction Industry Policy (2003)
- National Health Policy (2003)
- National Gender Policy of 2000
- National Human Settlements Development Policy (2000)

Principal Legislations and Regulations

- Environmental Management Act (2004)
- The Environmental Management (Fees and Charges) Regulations, 2021
- The Environmental Management (Control of hazardous Waste) regulations, 2021

- The Environmental Management (Control of Noise and vibration) regulations, 2015
- The Environmental Management (Prohibition of Plastic Carrier bags) regulations, 2019
- The Environmental Management (Solid Waste Management) regulations, 2007
- Occupational Health and Safety Act 2003
- Water Supply and Sanitation Act No. 5 of 2019 12
- Engineers Registration Act and its Amendments 1997 and 2007
- Public Health Act (2009)
- World Bank Environmental and Social Safeguards
- Institutional Framework

BASELINE INFORMATION

Introduction

This section provides baseline data on the relevant environmental characteristics of the project area in Kibaha Municipal Council, Coast Region. The description focuses on site-specific conditions relevant to the proposed Faecal Sludge Treatment Plant (FSTP), as well as broader environmental and socio-economic factors covering the wider Kibaha Municipality.

Data was obtained from primary field surveys, physical observation, and secondary sources, including the Kibaha Socio-Economic Profile (2019), Tanzania Meteorological Authority (TMA) data, and other literature on the Coast Region.

Kibaha's location along the Dar es Salaam-Morogoro highway and its proximity to Dar es Salaam City have made it one of the fastest-growing urban areas in Tanzania, attracting residential, commercial, and institutional development. The rapid population growth and increased waste generation have made improved sanitation infrastructure such as the proposed FSTP a critical necessity.

Air Quality

Ambient air quality in the proposed project area is generally good, as the location is away from heavy industrial zones. However, dust may be generated during the construction phase and from unpaved roads nearby. The parameters monitored included particulate matter ($PM_{2.5}$ and PM_{10}), oxygen (O_2), carbon monoxide (CO), hydrogen sulfide (H_2S), carbon dioxide (CO_2), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2). The measurements were compared against the requirements of TZS 845:2019.

Noise and Vibration

The noise and vibration levels at the project site are rated negligible as the only source of noise at the project site are motor vehicles using the street feeder road adjacent to the project area.

Environmental noise levels at the Mitamba site were measured using an Integrating Averaging Sound Level Meter (Model Piccolo II, Class 2) in accordance with ISO standards. Measurements were conducted during daytime hours at five representative locations (P1–P5) around the proposed facility boundary and nearby sensitive receptors.

STAKEHOLDERS ENGAGEMENT

Introduction

Stakeholder engagement refers to a broad, inclusive, and continuous process to engage persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholder engagement enhances the effectiveness, efficacy, and accountability of the ESIA process and the project. When undertaken in a transparent, balanced manner, it can reduce conflicts and strengthen the sense of ownership of a project and the project's sustainability.

Stakeholder engagement often collaboratively identifies issues and options and helps make decisions based on input received via the stakeholder engagement process. Stakeholder engagement is a crucial part of the Environmental and Social Management Plan (ESMP) to ensure transparency, social acceptability, and community ownership of the FSTP Project in Mitamba area, Lumumba Mtaa. The engagement process follows World Bank Safeguard policy and national guidelines on public participation. Stakeholder's engagement was conducted twice (Internal meeting with local government authority and Public meeting) on 16th July and 17th July 2025, whereby the local leaders summoned a public Baraza and community was informed about the proposed project and their views were recorded as well as attendance which were attached in this report as appendix iii.

Objectives of Stakeholder Engagement

- To identify and involve stakeholders affected or likely to be affected by the project
- To collect concerns, feedback, and expectations from stakeholders
- To inform stakeholders about project scope, impacts, and mitigation measures
- To ensure stakeholder views are integrated into project design and implementation

Methods of Engagement

- Local leaders (Mtaa Leaders) internal meeting held in Lumumba Mtaa Office prior to public meeting/Baraza
- Public Consultative Meetings held at Lumumba Primary School
- Key Informant Interviews with local leaders and institutions
- Household Surveys to understand access and concerns regarding sanitation
- Information Dissemination via flyers, posters, and community boards

POTENTIAL ENVIRONMENTAL IMPACTS

Introduction

This section outlines the process of impact identification and assessment of impacts in each stage of the proposal. The section also proposes mitigation measures that the project proponent is committed to undertake so as to prevent or reduce the identified impacts.

Impact Identification

The proposed project has a potential of causing a wide range of environmental and social impacts on a number of receptors. The ESIA identify these impacts for the purpose of mitigating the adverse ones or enhancing the benefits. Impact Identification is a process designed to ensure that all potentially significant impacts are identified and considered in the ESIA process. A number of tools are available to assist in impact identification. The simplest and most frequently used, checklist of impacts method was used for this project. Also, professional judgment based on experience from projects of similar nature and superimposing impacts prediction with the baseline conditions of the site and the surrounding areas including Kibaha Municipal Council in general was used in identifying impacts from the proposed project.

Some of the Impacts includes:

- Employment opportunities for locals
- Improved public health and sanitation
- Reduction in groundwater contamination
- Promotion of environmental conservation
- Soil erosion due to land clearing
- Community concerns and opposition to the project
- Dust emissions from excavation and vehicle movement
- Noise pollution from machinery
- Waste generation (construction debris, packaging)
- Oil/fuel leaks contaminating soil and water
- Occupational health and safety risks for workers

Alternative 1: No Project Scenario

- **Description**: This option assumes that no intervention is made in Mitamba area, Lumumba Mtaa to address poor sanitation.
- **Implications**:
    - Continued reliance on unsafe on-site sanitation (e.g., poorly constructed pit latrines)
    - Increased risk of groundwater contamination and surface water pollution
    - Higher prevalence of waterborne diseases
    - Social and environmental degradation in a growing urban area

This option does not address urgent sanitation needs or public health risks.

Alternative 2: Alternative site

- **Description**: This involves identifying another location for the FSTP outside Lumumba Mtaa or even outside Pangani Ward.
- **Considerations**:
    - It will be time consuming and additional cost

- Mitamba area in Lumumba Mtaa is under jurisdiction of Kibaha Municipal hence no compensation needed searching for alternative site could lead to compensation

ENVIRONMENT AND SOCIAL MITIGATION MEASURES

Introduction

Mitigation Measures are "actions" to be applied in order to minimize or alleviate adverse impacts that may be caused by project implementation. A number of enhancement measures for positive impacts and mitigation measures for negative impacts are proposed hereunder. The positive benefits of the project will be maximized and any adverse negative impacts will be avoided or at least minimised/mitigated. The mitigation measures have been defined based on stakeholder input, expert analysis and opinion, experience with similar projects and best engineering practice;

- Limit land clearing to necessary areas only (Construction corridor only).
- Conduct construction during dry periods where feasible.
- Re-vegetate exposed areas as soon as possible.
- Conduct continuous stakeholder engagement and awareness campaigns during and after project implementation.
- Provide clear information on project benefits and odor control.
- Establish a grievance redress mechanism.
- Include community representatives in monitoring and site visits.
- Water spray exposed soil and roads to suppress dust.
- Cover trucks transporting soil and materials.
- Limit vehicle speeds within and around the construction site.
- Provide PPE (dust masks, goggles) to workers.
- Use well-maintained, low-noise machinery.
- Limit construction to daytime hours.
- Provide ear protection to workers.

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 Introduction

The Environmental and Social Management Plan (ESMP) presents the implementation schedule for the proposed mitigation measures to both environmental and social impacts as well as planning for long-term monitoring activities. The ESMP also includes the associated environmental costs needed to implement the recommended mitigation measures. The engineering designs have already included some of the mitigation measures recommended in this report. For instance, the use of shallow, small-diameter sewer pipes minimizes the need for deep excavations, thereby reducing risks of soil erosion, landscape disturbance, and property damage. Additionally, routing the pipes along road reserves and rear plot boundaries helps avoid major roads and private properties, which in turn reduces traffic disruptions and eliminates the need for relocation or compensation.

However the disruptions are expected during construction and maintenance phase of which the setbacks are minor and can be solved through the proposed mitigations

measures. Additional recommendations are provided in the ESMP to enable the proposed facilities become more environmentally friendly. The implementation steps will involve DAWASA, the contractor, Kibaha Municipal Council, some utilities providers such as TANESCO, and the local communities at large.

Table 8-1 Provide the ESMP for the proposed construction of Fecal Sludge Treatment Plant to be constructed at Mitamba area, Lumumba Mtaa, Pangani Ward, and Kibaha Municipality, ESMP costs about 130,000,000 Tanzania Shillings.

ENVIRONMENTAL AND SOCIAL MONITORING PLAN

Introduction

Monitoring of the anticipated environmental and social risks and impacts in the receiving environments is important. It helps in determining the effects of the project activities on the environments enhancing understanding of cause effect relationships between human activities and environmental changes, and verifies the accuracy of prediction about the environmental impacts. It ensures compliance with regulatory measures and understanding the degree of implementation of EMP and its effectiveness. The monitoring results are also used extensively during the environmental auditing.

The Tanzanian EIA regulations require the developer to prepare and undertake a monitoring plan and conduct regular auditing. Monitoring is needed to check if and to what extent the impacts are mitigated, benefits enhanced and new problems addressed. Recommendations for monitoring have been included in the ESMP (Table 9-1). The ESMP also assigns responsibilities for monitoring activities. However, the divisional/ward/village environmental committees and municipal environmental committee will participate in the long-term daily monitoring of the project, especially during operation. The total cost for Monitoring is about 98 Million TZS.

CONCEPTUAL DECOMMISSIONING PLAN

Introduction

The conceptual decommissioning plan outlines the strategies that will be adopted at the end of the operational life of the Kibaha Faecal Sludge Treatment Plant (FSTP). Decommissioning involves the systematic closure, dismantling, and rehabilitation of the site to ensure that no long-term environmental or social risks remain. Although the project is expected to operate for several decades, advance planning is crucial to minimize potential adverse impacts during the closure phase and to facilitate the safe transfer of the site for alternative land uses. The conceptual decommissioning plan for the Kibaha FSTP demonstrates foresight in managing the eventual closure of the facility. By emphasizing environmental protection, occupational health and safety, and social safeguards, the plan ensures that decommissioning will be carried out responsibly. The ultimate goal is to restore the site for safe and productive future use while minimizing long-term environmental liabilities and safeguarding community welfare.

Objectives of Decommissioning

The primary objectives of decommissioning are to:

- Ensure safe dismantling and removal of treatment infrastructure.
- Prevent contamination of soil, groundwater, and surface water from residual sludge and construction materials.

- Protect the health and safety of workers and surrounding communities during demolition activities.
- Manage and dispose of waste materials in an environmentally sound manner.
- Restore the project site to a condition suitable for alternative beneficial uses, such as community facilities, open space, or industrial development.
- Minimize social and economic disruption to workers and the host community.

COST BENEFIT ANALYSIS

Overview

The objective of the cost benefit analysis for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba Area in Pangani Ward, Kibaha Municipal Council, is to evaluate the economic, environmental, and social benefits of the project in comparison with the resources required for its implementation. The analysis aims to translate the expected impacts of the project into measurable terms while recognizing that the project's capital investment occurs mainly during the construction phase, whereas the benefits accrue progressively throughout the operational life of the facility.

The proposed FSTP will play a critical role in improving fecal sludge management services within Kibaha Municipality by providing a designated facility for the safe treatment and disposal of sludge collected from septic tanks and pit latrines. The facility is expected to operate for an estimated design life of approximately 20 Years, during which time it will contribute to improved environmental quality, enhanced public health, and sustainable urban sanitation management.

In sanitation infrastructure projects, the key elements that can be evaluated include improvements in public health conditions, reduction of environmental pollution, operational and maintenance costs, infrastructure investment costs, and the long-term residual value of the treatment facility.

CONCLUSION

The Environmental and Social Management Plan (ESMP) for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba Area under Kibaha Municipal Council, to be implemented by DAWASA, provides a structured and systematic framework for identifying, mitigating, monitoring, and managing environmental and social impacts associated with both the construction and operational phases of the project.

The ESMP outlines clearly defined mitigation measures, monitoring indicators, institutional responsibilities, reporting mechanisms, and budget allocations to ensure that all project activities are implemented in compliance with national environmental legislation and applicable international safeguard requirements. Through the effective implementation of the ESMP, adverse impacts such as soil erosion, surface water contamination, dust emissions, noise disturbance, occupational health risks, and temporary disruptions to nearby communities are expected to be reduced to acceptable levels.

However, despite the application of mitigation measures, certain residual environmental and social risks may remain. These include:

- Potential occasional odor emissions during peak sludge offloading or operational upset conditions;
- Increased traffic movement of sludge trucks along access roads, which may pose minor safety risks to local road users;
- Occupational exposure risks to workers handling sludge and treatment chemicals;
- Community perception risks or concerns related to stigma associated with sanitation facilities;
- Risk of accidental spills or system malfunction during extreme rainfall events linked to climate variability.

These residual risks are anticipated to be low to moderate in magnitude and manageable through continuous monitoring, adaptive management, and routine maintenance of treatment infrastructure, emergency preparedness planning, and sustained stakeholder engagement.

To address residual risks, the project will implement:

- Continuous environmental quality monitoring (air, water, noise, and effluent quality);
- Preventive maintenance and contingency planning for plant systems;
- Community grievance redress mechanisms;
- Ongoing occupational health and safety supervision;
- Periodic ESMP performance audits and reporting to relevant authorities.

Overall, the anticipated long-term benefits of the project including improved sanitation services, reduced indiscriminate sludge disposal, enhanced public health outcomes, environmental protection, and local employment opportunities significantly outweigh the identified residual risks.

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CHAPTER ONE

1.1 Background

The Government of the United Republic of Tanzania (GoT) through the Dar es Salaam Water and Sewerage Authority (DAWASA) under the Ministry of Water intends to implement an Off Grid Sanitation Project (OGSP) to serve peri-urban areas not connected to the central sewerage system. DAWASA has received financing from the International Development Association (IDA) in the form of a credit to implement the project. Prior to implementing the project, the law in Tanzania requires an Environmental Impact Assessment to be conducted and approved by relevant authority. In order to comply with the law in Tanzania, the DAWASA intends to apply a portion of the proceeds of the credit to eligible payments for consulting services for Preparation of Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) Report for construction of off grid sanitation projects.

Kibaha, located in Pwani Region of Tanzania, has experienced significant transformation over the past two decades. Formerly a modest township with scattered rural characteristics, Kibaha has evolved rapidly, both demographically and economically, owing largely to its strategic proximity to Dar es Salaam, the country's largest commercial city. Situated approximately 40 kilometers west of Dar es Salaam along the major Morogoro Highway, Kibaha has increasingly become a residential, commercial, and institutional extension of the growing metropolitan region.

In recognition of this rapid urbanization and socio-economic transformation, Kibaha was officially upgraded to a Municipal Council status, a move that formalized its transition into a dynamic urban area with growing administrative, service delivery, and infrastructural needs. The upgrade reflects increasing pressures on local infrastructure due to:

- A surge in population, both from natural growth and rural-urban migration.
- Expansion of residential housing estates, peri-urban settlements, and informal developments.
- The establishment of various public institutions and industrial activities, including educational and health facilities.
- A growing number of small and medium enterprises (SMEs) contributing to local economic diversification.

Despite these gains, sanitation infrastructure has not kept pace with the urban expansion, particularly in unplanned and peri-urban areas. Most households rely on on-site sanitation systems, such as pit latrines and septic tanks, which are increasingly under strain due to poor maintenance, insufficient emptying services, and lack of safe sludge disposal mechanisms. This situation presents considerable risks to public health, environmental quality, and water resource protection, especially during the rainy season when leaching and overflow are common.

In response to the persistent environmental and public health challenges arising from inadequate sanitation in urban and peri-urban areas, the Government of Tanzania, through the Ministry of Water and in collaboration with the Dar es Salaam Water and Sewerage Authority (DAWASA), is implementing the Off-grid Sanitation Project. This initiative is financed by the World Bank and aims to provide improved sanitation infrastructure to underserved communities that are not connected to the central sewerage network. The proposed Off-grid Sanitation Project in Kibaha Municipal is the construction of a Fecal Sludge Treatment Plant (FSTP) in Mitamba area, Lumumba Mtaa, Pangani Ward within Kibaha Town Council. The facility will serve as a critical intervention to:

- Improve urban sanitation services through safe collection, transport, treatment, and disposal of fecal sludge.
- Prevent environmental contamination.
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The EIA is prepared in line with World Bank Safeguard Policies requirements, Tanzanian Environmental Management Act (2004), and other relevant legal instruments. The document outlines mitigation, monitoring, and institutional arrangements for managing potential impacts. According to

1.2 Nature of the Project

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1.3 Scope of the ESMP

This Environmental and Social Impact Assessment (ESIA) for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba area, Lumumba Mtaa, Pangani Ward, Kibaha defines clear temporal, spatial, and institutional boundaries to guide the assessment of potential impacts. Spatially, the study covers the entire project footprint, including treatment units, access roads, drainage systems, and ancillary facilities, as well as adjacent areas that may be directly or indirectly affected by construction activities, traffic movements, odour emissions, noise, dust, and surface runoff.

The broader area of influence, including nearby residential areas and community facilities, has also been considered. Temporally, the assessment encompasses all phases of the project lifecycle, including pre-construction, construction, long-term operation, and eventual decommissioning. Institutionally, the ESIA considers the roles and responsibilities of the Project Proponent, contractors, municipal authorities, regulatory agencies, and other relevant stakeholders involved in environmental management, monitoring, and compliance throughout the project implementation period. This integrated approach ensures that environmental and social risks are identified and managed within clearly defined operational and administrative limits.

1.4 Expected Environmental Improvements

The implementation of the proposed Fecal Sludge Treatment Plant (FSTP) is anticipated to bring significant positive environmental and public health improvements in the Kibaha Town Council and surrounding communities. These benefits include:

- **Improved Sanitation and Hygiene Standards**

  The establishment of the FSTP will provide a centralized and scientifically managed system for treating fecal sludge, replacing unsafe and unhygienic disposal methods such as open dumping or uncontrolled infiltration. This will lead to cleaner living environments, particularly in densely populated and unplanned areas where septic tanks and pit latrines often overflow or leak. As per feasibility study about 70-90% of the collected fecal sludge within the service area will be directed to a controlled treatment facility, significantly reducing illegal dumping and unsafe disposal practices

- **Reduction in Groundwater and Surface Water Contamination**

  Poorly managed fecal sludge is a major source of contamination to groundwater aquifers and nearby surface water bodies, especially during the rainy season. The FSTP will reduce pollution loading from untreated sludge, thereby improving the quality of water resources used for domestic and agricultural purposes.

- **Reduction in Vector-Borne and Waterborne Diseases**

  Untreated fecal sludge is a breeding ground for disease vectors such as flies and mosquitoes and a direct source of pathogens. By providing proper containment and treatment, the FSTP will help in significantly reducing the prevalence of diseases such as cholera, typhoid, dysentery, and malaria. The project is expected to contribute to a

decline in sanitation-related disease incidence, particularly cholera, typhoid, and diarrheal infections

- **Promotion of Safe Resource Recovery and Reuse**

  The project promotes a circular economy by allowing for the safe reuse of treated sludge as soil conditioner in agriculture and landscaping. Treated sludge is expected to be reused as soil conditioner in compliance with environmental standards, with a target of beneficial reuse of a significant portion of dried sludge output, thereby reducing dependence on chemical fertilizers in peri-urban agriculture.

- **Reduction of Greenhouse Gas Emissions and Odor Nuisance**

  Uncontrolled anaerobic degradation of fecal matter in open environments emits methane and other harmful gases. By capturing and managing organic load within properly designed treatment systems (such as anaerobic baffled reactors and drying beds), the project will reduce GHG emissions and minimize unpleasant odors.

- **Enhanced Institutional Capacity and Public Awareness**

  The implementation of the FSTP will be accompanied by capacity building for DAWASA, Kibaha Town Council, and local sludge operators. It will also include community awareness programs that promote hygiene, proper sanitation practices, and understanding of the environmental impacts of poor waste management.

- **Improved Urban Aesthetics and Land Use Efficiency**

  Properly planned sanitation infrastructure contributes to organized urban growth. The FSTP will support efforts in modernizing sanitation sector in Kibaha, freeing up land previously affected by indiscriminate dumping and fostering better use of urban spaces.

CHAPTER TWO

2.1 PROJECT DESCRIPTION

2.1.1 Project Location and Justification for Site Selection

The proposed Fecal Sludge Treatment Plant (FSTP) will be located at Mitamba area, within Lumumba Mtaa, in Pangani Ward, which is part of Kibaha Municipal Council, in the Pwani Region of the United Republic of Tanzania approximately 13.7kilometers from the Kibaha Town center. The selected site lies on the outskirts of Kibaha town and is strategically positioned to serve urban and peri-urban settlements within the municipality. The area is accessible via existing local access roads that connect to the main highway (Morogoro Road – A7), which facilitates the movement of fecal sludge transportation trucks and construction materials. The site is situated in a semi-urban environment characterized by scattered residential housing, open spaces, and low-density development. This area was chosen based on several criteria.

Table 2-1 Criteria for Site selection

S/N	Criteria	Description
1.	Land Availability	Availability of a sufficiently large parcel of public land about 24,340m^2 under municipal control, free from legal disputes or occupation.
2.	Topography and Drainage	The site is relatively flat with gentle slopes, reducing the need for extensive earthworks and allowing gravity flow between units. No flood-prone areas were identified.
3.	Accessibility	Proximity to existing road infrastructure allows easy access for vacuum trucks and construction equipment, minimizing logistics costs.
4.	Distance from Sensitive Receptors	The location is away from densely populated areas, schools, health centers, and sensitive ecosystems.
5.	Potential for Future Expansion	The site allows for phased expansion if faecal sludge volumes increase due to population growth or regional service extension.
6.	Compliance with Regulatory and Planning Frameworks	The location complies with land-use plans of Kibaha Town Council and the Environmental Management Act (Cap 191).

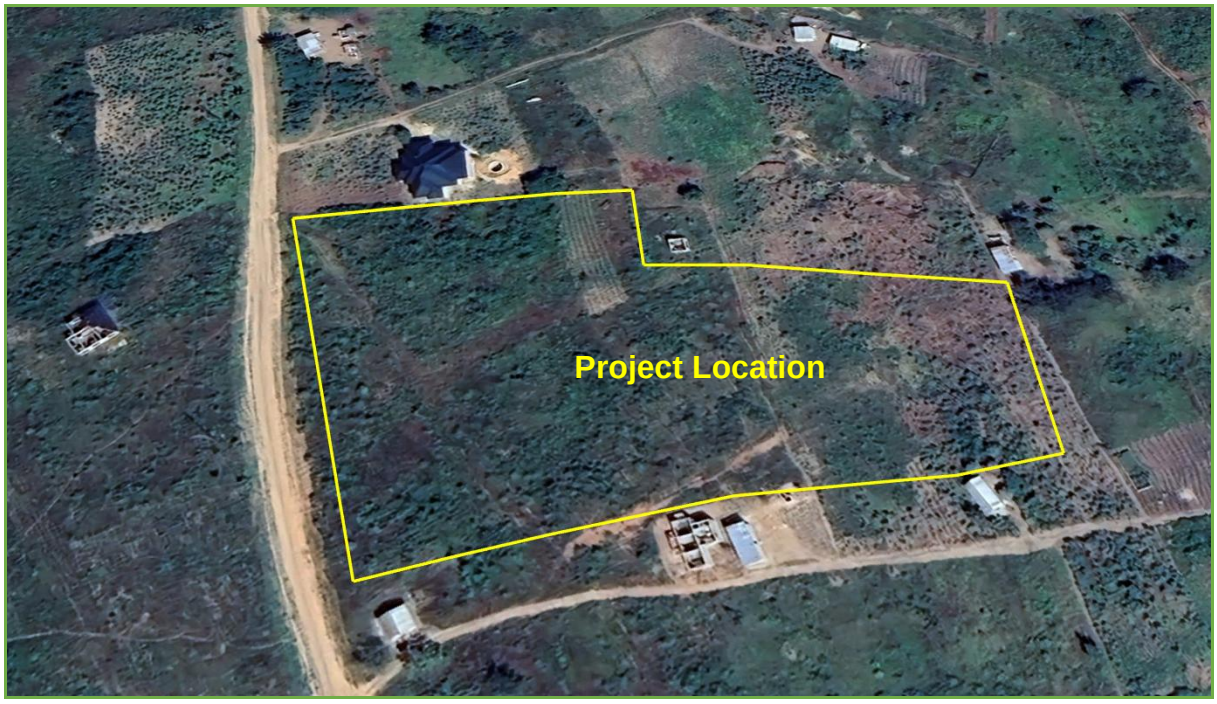

Figure 2-1: Extracted Google earth image showing proposed FSTP Location

2.1.2 Accessibility

The proposed FSTP project site is, approximately 13.7 km from Kibaha Town center and accessible via the Morogoro highway. From the main highway, access to the site is through a local feeder road that connects the settlement to the main road network.

Currently, the access road to the project site is a murram (earth) road, which is passable during dry seasons but may require improvement during the rainy season to allow smooth transportation of construction materials, desludging trucks, and maintenance vehicles. Temporary upgrading, such as graveling or grading, is recommended during the construction phase to ensure uninterrupted site access.

2.1.3 Land Ownership

The land allocated for the FSTP project and/or any centralized collection infrastructure has been officially allocated to DAWASA by the Kibaha Municipal Council. A formal allocation letter has been issued and attached as Appendix i, confirming that the area is public land under the jurisdiction of the Municipal Council, and is exempt from encumbrances or private claims. This provision ensures smooth project implementation immediately related to land tenure conflicts.

2.1.4 Land Use

The immediate project site is currently characterized by open land with scattered vegetation, grasses, shrubs, and isolated trees including mango and banana plants. Portions of the land are used seasonally for small-scale subsistence farming activities. There are no permanent industrial developments or large-scale commercial operations currently occupying the proposed footprint.

- The eastern and southeastern portions of the buffer area are characterized by low- to medium-density residential housing, consisting mainly of permanent masonry structures and semi-permanent dwellings. The nearest residential receptors are located approximately 180 to 250 meters from the proposed site boundary. These receptors have been considered in evaluating potential impacts related to odor, noise, traffic movement, and visual intrusion.
- To the northern and northeastern sections, scattered institutional and community facilities are present, including small private educational centers and places of worship serving the local community. No major hospital or large public institution is located within the immediate 500-meter radius; however, social infrastructure beyond this range was considered during stakeholder engagement.
- The western and southwestern portions of the buffer zone consist largely of open land with seasonal agricultural activities such as cassava, maize, banana, and mango cultivation. Vegetation cover includes grassland, shrubs, and scattered trees. These areas are not formally designated as protected ecological zones.
- Small-scale commercial activities such as retail kiosks and roadside vendors are present along the access routes leading toward the main highway. Traffic levels in the area are moderate and mainly associated with local residential movement and small business activities.
- No officially designated forest reserve, wetland, or environmentally protected area is located within the 500-meter buffer zone of the proposed site. Surface runoff channels conveying seasonal storm-water occur within the broader landscape and will be integrated into the site's storm-water management and drainage design to prevent off-site impacts.

2.2 Project Design

The proposed technology and construction design follows the objective to execute an engineering design of fecal sludge management facility (one in number at the stated site) which will be simple, cost effective/efficient, easy to operate and maintain performance standards which conform to NEMC. The proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba in Kibaha Town Council has been designed with an operational lifespan of twenty (20) years, taking into account projected population growth, increasing fecal sludge generation rates, urban expansion, and anticipated climate variability within the service area.

2.2.1 Process Description and project Components

The main treatment technologies that are adopted in the design of FSTP are based on solid-liquid separation, stabilization, dewatering of sludge and pathogen removal. The separated liquid component is also treated to meet discharge standards. The faecal sludge from different parts of the city will be conveyed to the FSTP through

manual or automated desludging trucks. The treatment modules for solid components are: Feeding (receiving) Tank (FT) with screen chamber, Settling-Thickening Tank (ST), Anaerobic Stabilization Reactor (ASR), Unplanted Drying Bed (UPDB). Treatment modules for liquid components are: Anaerobic Baffled Reactor (ABR), Settler, Constructed Wetland (CW) and Polishing pond. The treated water from the polishing pond will also be re-used for cleaning of the FSTP facilities. Figure 2-2

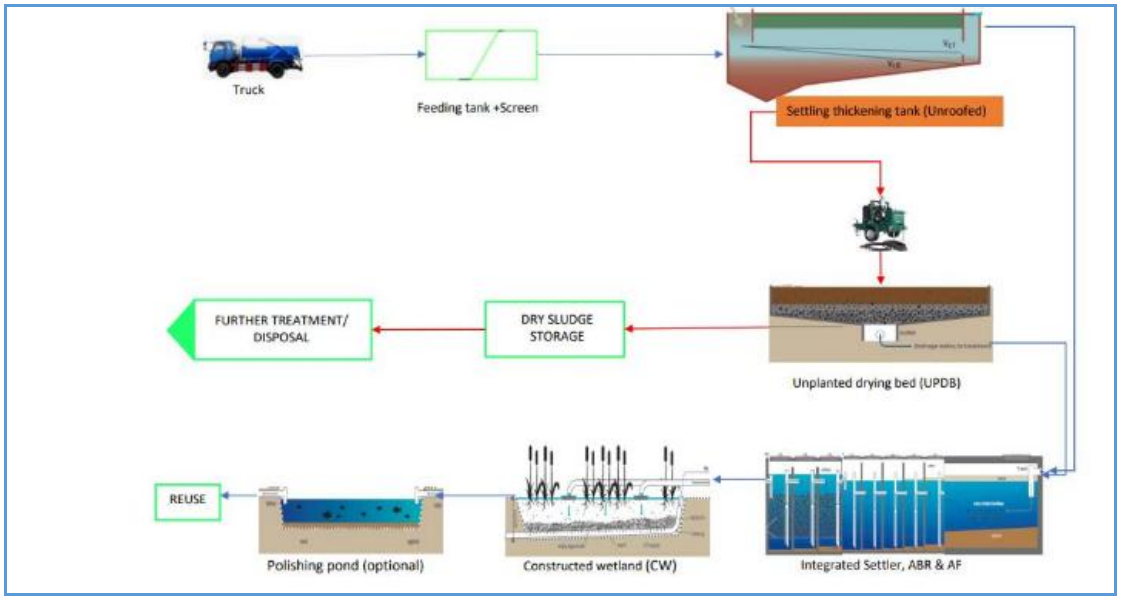

Figure 2-2: Plan and profile for route 1 section (Source Design Report, 2025)

Table 2-2: Project Componets

Component	Capacity	Treatment Category	Purpose/Function
Feeding (Receiving) Tank (FT)	20m^3	Solid & Liquid	Initial point of sludge discharge; includes screen to remove coarse materials
Screen Chamber	15cm/sec to 30cm/sec	Solid & Liquid	Removal of coarse materials (e.g., rags, plastics, debris)
Settling-Thickening Tank (ST)	80%	Solid-Liquid Separation	Separation of solid and liquid fractions
Anaerobic Stabilization Reactor (ASR)		Solid	Biological stabilization of solid waste under anaerobic conditions
Unplanted Drying	50-80%	Solid	Dewatering of sludge to reduce

Beds (UPDB)			moisture content
Lime Treatment & Storage		Solid	Further pathogen reduction in dried sludge
Anaerobic Baffled Reactor (ABR)		Liquid	Anaerobic digestion of the liquid fraction
Settler		Liquid	Further sedimentation and clarification of liquid waste
Anaerobic Filter	50%-80%	Liquid	Degradation of organic matter from the liquid stream
Constructed Wetland (CW)		Liquid	Natural filtration and pathogen reduction using wetland plants
Polishing Pond / Storage Pond	96% removal of faecal coliform	Liquid	Final treatment and storage of treated wastewater; allows for reuse in FSTP cleaning

2.2.2 Process design parameters

The number of beds required depends on the amount of sludge arriving at the plant per unit of time, the sludge layer thickness and the allowable sludge loading rate. For instance, for two weeks of drying duration and FS arriving 5 days per week, a minimum of 10 beds is required. The number of beds can then be increased or decreased considering the optimal sludge layer thickness. It is also important to adapt the number of beds based on the actual operating conditions, for example frequency of sludge removal. The proposed number of sludges is also dependent on the sludge drying retention time.

Since a loading cycle 20days has been adopted for ST upstream the same drying period duration is applied. The number of beds adopted are 14, 10, and 6 for large, medium and small size FSTP respectively. And given the pumping intervals of 3 days for the STs, two drying beds shall be fed during each sludge pumping form the settling tanks.

The basic design parameters proposed are summarized in **Table 2-3**.

Table 2-3: Design parameters

Parameter	Unit	Value	Range
Average sludge loading rate (SLR)	kgSS/m^2-year	160	100-200
Hydraulic loading	m	0.3	0.2-0.3
Evaporation	%	15%	15-30
Drying Period	days	20	15-20

(Source Design report 2025)

Table 2-4: Drying Beds Design

Parameter	Units	Value
		220m³/d
Total sludge and solids per year - yearly average		
Total Sludge and Scum Flow	m³/year	6,724
Total TS inlet	kgTS/year	603,168
Dimensioning of Drying Beds (DBs)		
Drying Period	days	20
Number of drying cycles (per year)	No	18.3
Hydraulic loading	m	0.30
Surface Area as per HLR	**m²**	**1,228**
Average solids loading	kgSS/m²/year	160
Surface Area as per SLR	**m²**	**3,770**
Proposed Drying Beds		
Number of beds	No	**14**
Unit width	m	**7**
Unit length	m	**26**
Area of Drying Bed (single)	m²	182
Total Area (Final)	**m²**	**2548**
Average hydraulic loading	m	0.14
Average sludge loading	kgSS/m²·year	237

(Source Design report 2025)

Table 2-5: Sludge and Leachate Quantities

Parameter	Units	Value
		220m³/d
Inflow characteristics		
Inflow	m³/year	6,724
Total TS inflow	kg/year	603,168
Inlet solids concentration	kg/m³	90
Sludge separation efficiency (Assumed)	%	99%
Dried Sludge Characteristics		
Total Solid (TS) in sludge	kg/yea	597,136

	r	
Dried Sludge solids concentration (Assumed)	kg/m³	250
Dried Sludge volume	m³/year	2,389
Evaporation		
Evaporation	%	15%
Water evaporated	m³/year	1009
Leachate flows		
Remaining leachate	m³/year	3,327
TS in leachate	kg/year	5,971
TS concentration in leachate	mg/l	1,795
Leachate (daily flow rate)	m³/day	**9.1**

(Source Design report 2025)

The leachate from each bed will be collected to a leachate collection pit and then transferred by gravity into the equalization/settler tank.

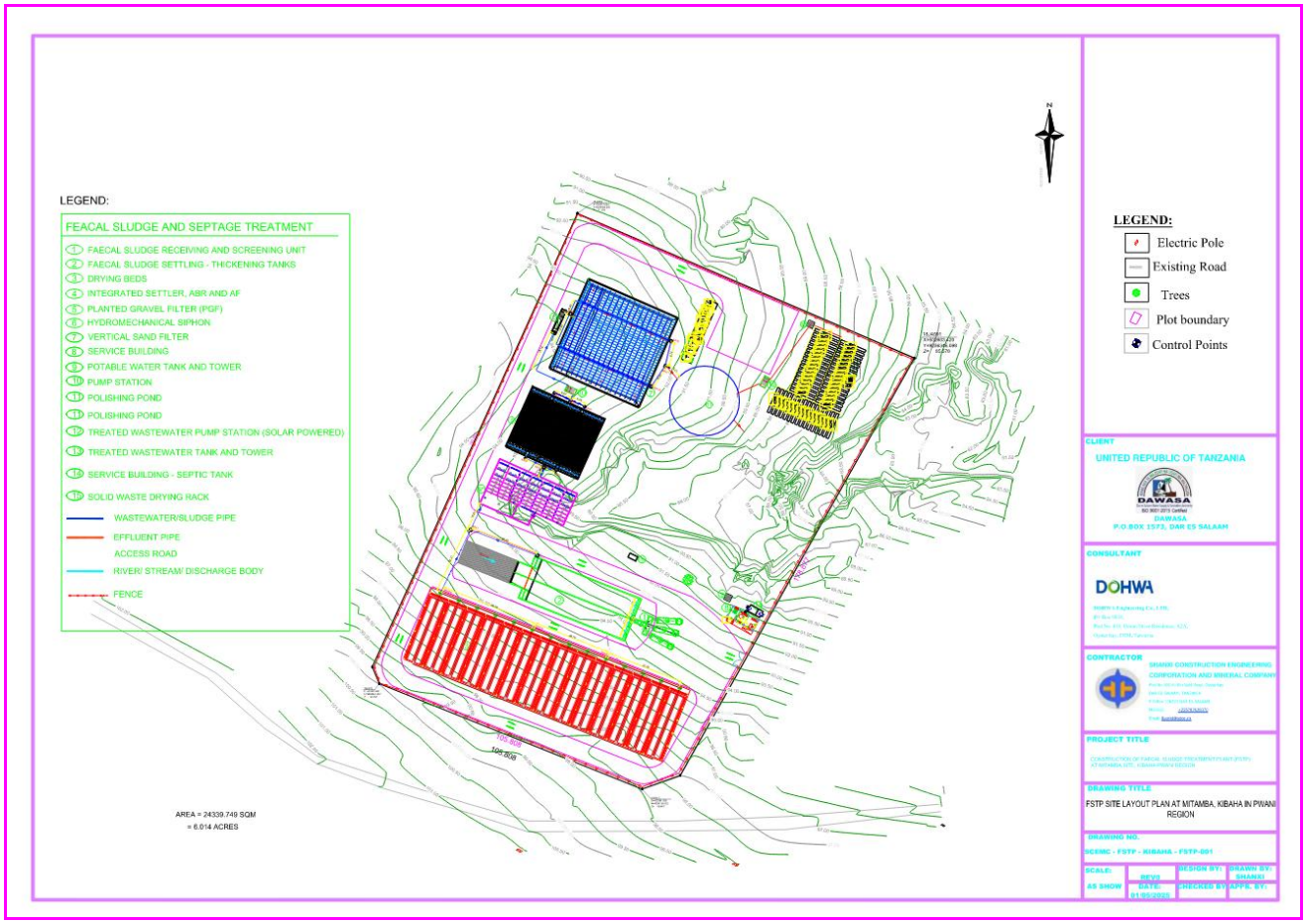

Figure 2-3: Site layout plan for Proposed project

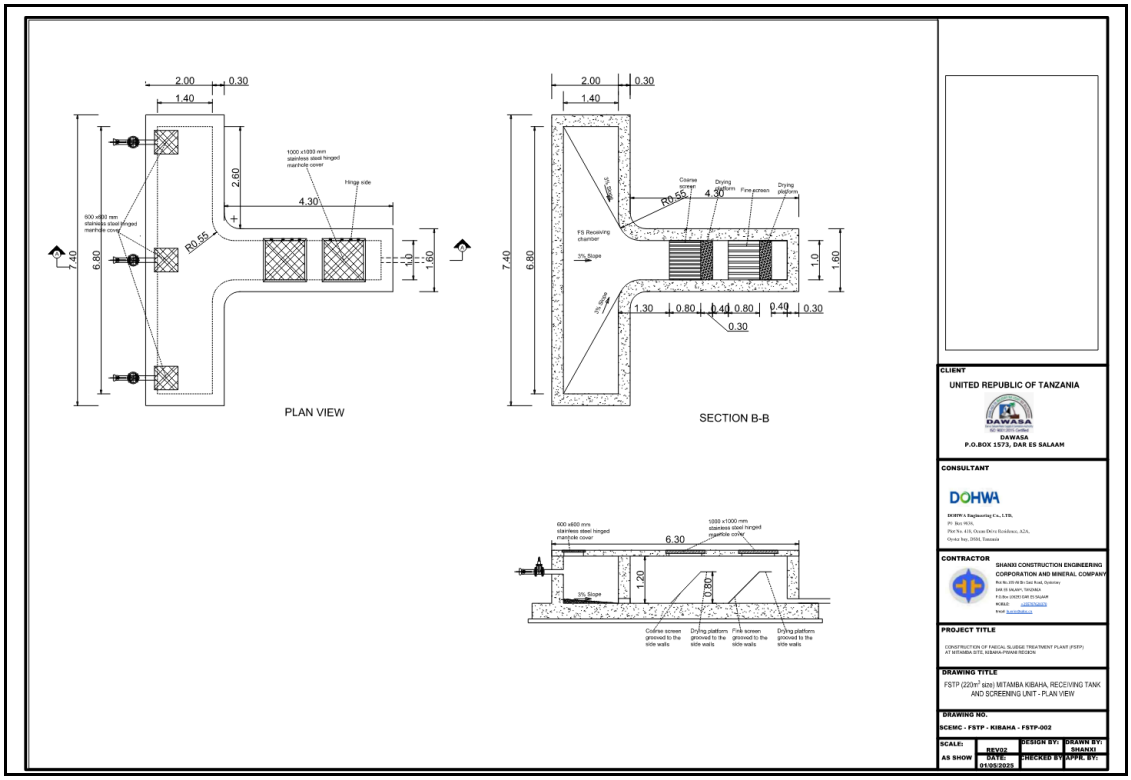

Figure 2-4: Proposed receiving and screen chamber

2.2.3 Project phases and Activities

The proposed project entails the construction and operation of a decentralized Fecal Sludge Treatment Plant (FSTP) that will safely manage sludge collected from pit latrines and septic tanks within Kibaha Town and its surrounding areas. The plant will be designed to handle an estimated capacity of 220m^3 of sludge per day.

Table 2-6: Project Phases

S/N	Phase	Key Activities
1.	Design Phase	• Topographic and geotechnical surveys • Environmental & Social Impact Assessment (ESIA) • Engineering design of treatment units • Stakeholder consultation and land confirmation • Preparation of detailed BOQ, drawings, and specifications
2.	Construction Phase	• Site clearance and excavation • Foundation works and base construction • Construction of receiving structures, tanks, drying beds, ponds, ABR, and wetlands • Installation of drainage, fencing, gates, and internal roads • Construction of offices, storage, and utility buildings

		• Erection of signage and basic landscaping
3.	Operation Phase	• Sludge receiving from trucks • Monitoring and control of flow between treatment units • Removal and disposal or reuse of treated sludge and effluent • Routine maintenance of treatment structures • Environmental and health & safety monitoring • Community awareness and grievance redress
4.	Decommissioning Phase *(future/optional)*	• Dismantling of structures (if necessary) • Safe disposal of residual waste/sludge • Site restoration and re-vegetation • Community handover or redevelopment planning

2.3 Utilities

2.3.1 Wastewater Generation

Wastewater generation was estimated basing on the per capita consumption of water supply of which 85% percent is converted into wastewater. The per capita consumption is considered as 60 liters/day as stated in the Design, Construction Supervision, Operation and Maintenance (DCOM) Manual; Volume II Design of Sanitation Projects (4th Edition), Ministry of Water (MoW), (March 2020) and confirmed from the household surveys conducted. However considering the design specifications of the proposed FSTP the amount of wastewater that will be generated after the whole process is estimated to be 75,746m^3/Year (Design report, 2025). The treated wastewater will be discharge in the nearby stream.

2.3.2 Labour

The proposed Fecal Sludge Treatment Plant (FSTP) project will employ different categories of manpower during its phases. During the construction phase, the project is expected to employ approximately 40–50 workers, including skilled, semi-skilled, and unskilled labour. Skilled workers will include civil engineers, plumbers, electricians, and machine operators, while semi-skilled and unskilled workers will mainly handle masonry, excavation, and general labour. Most unskilled labour will be sourced from the local community to enhance local employment opportunities. Gender inclusion will be considered to ensure both men and women have equal opportunities in employment, particularly for support and administrative roles and food vendors.

2.3.3 Electricity

The main source of electricity is from TANESCO and the estimated power consumption per month is about 1,000 units. However, there is a standby generator with 30KVA as an alternative source of power during power cut off.

2.4 Climate Change Adaptation

The proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba in Kibaha Town Council has been designed to address climate change issues through both mitigation and adaptation measures integrated into its planning, design, and operational phases. In terms of climate change mitigation, the project will significantly reduce greenhouse gas emissions by preventing uncontrolled dumping of fecal sludge into open areas, rivers, and informal pits, where it would otherwise decompose anaerobically and release methane, a highly potent greenhouse gas. Through controlled treatment processes such as drying beds and stabilized sludge management, methane emissions will be minimized. The project will promote resource recovery options such as composting of treated sludge for agricultural use, thereby reducing reliance on synthetic fertilizers whose production is energy-intensive and carbon-emitting.
From an adaptation perspective, the project strengthens community resilience to climate-related risks such as flooding, extreme rainfall events, and prolonged dry periods. Kibaha Municipality has experienced increased rainfall variability and localized flooding, which can cause overflow of poorly managed sanitation systems and contaminate water sources. By providing a centralized and properly engineered sludge treatment facility with adequate storm-water drainage, and flood protection measures, the project reduces the vulnerability of sanitation infrastructure to extreme weather events. Proper sludge management also protects groundwater and surface water resources during heavy rains, reducing the risk of climate-induced waterborne disease outbreaks.

Additionally, the project contributes to climate resilience by promoting safe sanitation coverage in rapidly growing urban areas, thereby reducing public health risks that are exacerbated by rising temperatures and changing rainfall patterns. Improved sanitation services reduce environmental degradation, enhance soil quality through safe reuse of treated biosolids, and support sustainable urban development. Overall, the Mitamba FSTP aligns with national climate policies and sustainable development objectives by lowering emissions, protecting natural resources, and enhancing adaptive capacity within Kibaha Town Council.

CHAPTER THREE

POLICIES, LEGISLATION AND INSTITUTIONAL ASPECT

3.1 INTRODUCTION

According to the fundamental principles of environment, any developmental activities of this nature such as construction of Faecal Sludge Treatment Plant would have socio-economic and somehow environmental impacts that must be addressed and governed in order to serve public interest and sustainable development. Given the many existing and developing environmental laws, regulations and standards in Tanzania, it is worth considering resorting to constitutional provisions to protect and manage the environment. With increasing environmental awareness in recent decades, the environment has become a higher political priority and many constitutions now expressly guarantee a 'right to a healthy environment', as well as the procedural rights necessary to implement and enforce the substantive rights granted. The public or national interest in this aspect is addressed through government Policies and regulated by Principal Acts and Regulations. The implementation of the proposed project shall touch various sectors; therefore, the developer has to comply with number of cross-sectorial policies and legislations relevant to this project. Also, the listed institutions involved in environmental management for the project is included in this chapter.

3.2 RELEVANT POLICIES

This section focuses on various policies which guide the development aspects for sustainable vision, apart from the national environmental policy, there are numbers of sector policies that are to be reviewed when executing the proposed development and these include;

3.2.1 National Environment Policy 2021

This is the main policy document governing environmental management in the country. The NEP defines environmental issues as both natural and social concerns and adopts the key principle of sustainable development. The NEP has also proposed the framework environmental legislation to be taken into account by the numerous agencies of the Government involved in regulating the various sectors. The NEP provides the overall framework for environmental management in the country and promotes sustainable development, pollution control, environmental protection, and integration of environmental considerations into development planning. The proposed project aligns with the objectives of the Policy by ensuring that environmental considerations are integrated into all stages of planning, design, construction, and operation. This alignment is demonstrated through:

- Conducting an Environmental and Social Impact Assessment (ESIA) prior to project implementation.

- Identifying potential environmental and social impacts associated with the project.
- Developing mitigation, management, and monitoring measures to prevent or minimize adverse impacts.
- Promoting proper waste management practices to prevent soil, water, and air pollution.
- Enhancing public health and environmental sanitation.
- Establishing institutional responsibilities for environmental compliance and monitoring.

Through these measures, the project contributes to sustainable environmental management and supports national objectives for pollution prevention and improved environmental quality.

3.2.2 National Land Policy of 1997

The National Land Policy states that "the overall aim of a National Land Policy is to promote and ensure a secure land tenure system, to encourage the optimal use of land resources, and to facilitate broad-based social and economic development without upsetting or endangering the ecological balance of the environment". This study partly responds to this requirement. However the piece of land where the proposed project will be built was previously owned by Kibaha Municipal and later on awarded to DAWASA for implementation of the FSTP project.

3.2.3 Construction Industry Policy (2003)

Among the major objectives of the policy, which supports a sustainable building development sector, include the promotion and application of cost effective and innovative technologies and practices to support socio-economic development activities such as sanitation, water supply, buildings, road-works, shelter delivery and income generating activities and to ensure application of practices, technologies and products which are not harmful to either the environment or human health. Proposed project is in-line with this policy as ultra-modern technology is used during construction and its operation.

3.2.4 National Health Policy (2003)

The health Policy is a vital guide towards health development of any country. It is particularly, important in a country like ours where resources and technology are more limited than in other countries, which are relatively better off in both technology and resources. This Policy is a revision of the 1990 Health Policy, which emphasized on the need for increasing community involvement in health development and improved access and equity in health and health services.

The Policy recognizes the challenges of consolidating the principles of the previous health policy in community involvement, improved health services provision, access

and equity while addressing the different dimensions of reforms that are taking place in the Public Sector.

The proposed project will adhere to policy requirements to ensure no transmission of such communicable diseases between construction workers and the community, protect workers from all sorts of health risks and hazards; and provide adequate sanitation services within the project and ensure that its activities are not a source of health issues.

3.2.5 National Gender Policy of 2000

The overall objective of the Gender and Development Policy is to promote gender equality and equal participation of men and women through facilitation of access to education, child care, and employment and decision making. Also, this policy is to provide guidelines that will ensure that gender-sensitive plans and strategies are developed in all sectors and institutions. While the policy aims at establishing strategies to eradicate poverty, it emphasizes gender quality and equal opportunity of both men and women to participate in development undertakings and to value the role played by each member of society. The proposed project will adhere the requirements addressed under this policy.

3.2.6 National Human Settlements Development Policy (2000)

Among the objectives of this policy is to improve the level of the provision of infrastructure and social services for the development of sustainable human settlements and to make serviced land available for shelter to all sections of the community. Such infrastructure and services constitute the backbone of urban/rural economic activities. Feacal Sludge Treatment Plant (FSTP) is one among of the important infrastructure for the Kibaha community and country at large.

3.3 PRINCIPAL LEGISLATIONS AND REGULATIONS

The ESIA team reviewed several legislations relevant to the construction of Feacal Sludge Treatment Plant. These encompass Principal Acts that support and provide guidelines to implement the intended project as discussed below.

3.3.1 Environmental Management Act (2004)

Among the major purposes of the EMA are to provide the legal and institutional framework for sustainable management of the environment in Tanzania; to outline principles for management, impact and risk assessment, the prevention and control of pollution, waste management, environmental quality standards, public participation, compliance, and enforcement; to provide the basis for the implementation of international instruments on the environment; to provide for the implementation of the National Environmental Policy; to provide for the establishment of the National Environmental Fund and to provide for other related matters.

Part III, Section 15(a) states that "*in matters about the environment, the Director of Environment shall coordinate various environment management activities being undertaken by other agencies to promote the integration of environmental considerations into development policies, plans, programs, strategies projects and undertake strategic environmental assessments to ensure the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of the quality of human life in Tanzania*".

Part X of the law deals with Environmental Quality Standards. Section 140 of this act states that "*The National Environmental Standards Committee of the Tanzania Bureau of Standards established under the Tanzania Bureau of Standards Act, 1975 shall develop, review and submit to the Minister proposal for environmental standards and criteria concerning; water quality; discharge of effluent into the water; air quality; control of noise and vibration pollution; sub-sonic vibrations; soil quality, control of noxious smells; light pollution; and any other environmental quality standard*" Some of these standards have already been published in the government *gazette* while others are not in place. This project shall take into account all the standards specified by this act.

3.3.2 The Environmental Management (Fees and Charges) Regulations, 2021

These Regulations shall apply in relation to an act or service in respect of which fees and charges are payable under the Act and Regulations made thereunder. The regulations emphasize that "a person shall not, upon payment of fees and charges prescribed in the Schedule to these Regulations, carry on any of the following":

- Environmental Impact Assessment;
- Environmental Compliance Monitoring and Audit;
- Registration of Environmental Experts;
- Environmental Quality Standards;
- Noise and Vibrations; or
- other activities related to the environment

This project complies with the regulations since the proponent has already paid registration fees and review charges as directed by NEMC.

3.3.3 The Environmental Management (Control of hazardous Waste) regulations, 2021

The objective of these regulations is to protect the environment and human health by preventing or reducing the generation of Hazardous waste, the adverse impacts of the generation and management of hazardous waste and by reducing overall impacts of resource use and improving the efficiency of such use, which are crucial for the transition to a circular economy. The regulation requires that "any person generating, collecting, storing, transporting, treating, recycling, reusing, recovering and disposing of hazardous waste or any person exercising jurisdiction under these Regulations shall, assure that there are no adverse impacts to be generated or caused by the activity conducted. Project developer will comply with the

requirements of this regulation by reducing the construction materials which may generate hazardous impacts, as well as proper handling of such waste such as in use of fuels for various purposes etc.

3.3.4 The Environmental Management (Control of Noise and vibration) regulations, 2015

The regulations focus on the maintenance of a healthy environment for all the people in Mainland Tanzania, the tranquility of their surrounding and their psychological well-being by regulating noise and vibration levels to prescribe the maximum permissible noise and vibration levels from a facility or activity to which a person may be exposed. The project developer will make sure that all the guidelines under this policy will be considered to ensure the healthy environment to everyone.

3.3.5 The Environmental Management (Prohibition of Plastic Carrier bags) regulations, 2019

Regulations are meant to impose a total ban on the import, export, manufacturing, sale, and use of plastic carrier bags regardless of their thickness. Plastic carrier bags has a wide definition in the Regulations, as a bag made of plastic film, with or without handles, or gussets and to which its layer is in any thickness. The Regulations also categorically state that no person shall sell or offer for sale beverages or other commodities wrapped in plastics unless the nature of such commodities require wrappings by plastics, and restricts any licensing authority from issuing any licenses after the Regulations come into force. Project developer will make sure that there will be no use of plastic bags within the project site and the whole project life time, also in case of the need of carrier bags the proponent will make sure that there will be an alternative bags which are allowed by the regulations. For the commodities that are wrapped in plastic, then the proponent will make sure that such plastic will be handled properly.

3.3.6 The Environmental Management (Solid Waste Management) regulations, 2007

The solid waste management regulation of 2007, provides general directive on management of solid waste as follows: -

Regulation detail the requirements and responsibilities for managing solid waste in Tanzania

Highlight waste minimization and cleaner production principles alongside the duty to safeguard the public health and the environment from adverse effects of solid waste. Detail permitting requirements notably that any person dealing with solid waste as collector, transporter, waste depositor or manager of a transfer station will apply to the LGA for a permit. The local authority will also issue licenses to individuals or companies qualified to operate solid waste disposal sites; permit is required to operate an LGA waste disposal site. The proposed project is expected to generate

solid waste in construction phase. Therefore, to comply with this regulation the Project developer will engage the registered solid waste collection contractor.

3.3.7 The Environmental Management (Water Quality) regulations, 2009

Regulations provide for institutional and legal framework for sustainable management and development of water resources; to outline principles for water resources management; to provide for the prevention and control of water pollution; to provide for participation of stakeholders and the general public in implementation of the National Water Policy. These regulations require the sustainable management of water sources and proper use of the available sources without causing any damage towards such sources. Also, the regulations emphasize that it is every one's responsibility to conserve and preserve the available water sources in Tanzania. During all phases of the project there will be water demand, hence the project developer will make sure that there will be a sustainable use of water. Also during construction and maintenance phase the developer will make sure that the water supply pipes will not be damaged in either ways.The effluent quality for the proposed project will follow the standards as per Table 3-1:

Table 3- 1: Final Effluent Quality

	COD (mg/l)	BOD (mg/l)	TSS (mg/l)	TN (mg/l)	TP (mg/l)	FC (count/100ml)	Efficiecy			
Module							**Cod,BOD&TSS**	**TN**	**TP**	**FC**
influent	4,727	1,883	3,221	1,180	212	5,760,000,000				
Settler	2,364	942	2,577	944	191	5,184,000,000	50%	20%	10%	10%
ABR	355	141	1,546	566	114	3,110,400,000	85%	40%	40%	40%
AF	53	21	928	340	69	1,555,200,000	85%	40%	40%	50%
HV-CW	8	3	139	51	27	155,520,000	85%	85%	60%	90%
VF_CW			21	8	11	7,776,000		85%	60%	95%
Polishing pond						77,760				99%
Final effluent	**8**	**3**	**21**	**8**	**11**	**77,760**				
Effluent standards (TZS 860: 2019E)	**60**	**30**	**100**	**20**	**6**	**10,000**				

(Source: Design report 2025)

3.3.8 The Environmental Management (Air Quality) regulations, 2009

The Regulations were formed in order to: -

- Prohibit emissions and releases of hazardous substances into the environment
- Prescribe permissible emission limits and quantities of emissions of sulphur oxide, carbon monoxide, black smoke and suspended particulate matters, nitrogen oxide, ozone, hydrocarbons, dust and lead
- Empower NEMC to issue air pollutant emission permits, enforce compliance, undertake emergency prevention and issue stop orders

- Set baseline parameters on air quality and emissions based on a number of practical considerations and acceptable limits and ensure protection of human health and the environment from various sources of pollution.

The proposed project will adhere the requirements of this Act, emission limits will be monitored to the permissible limits.

3.3.9 The Environmental Management (Soil Quality) regulations, 2009

These Regulations, made by the Minister of State under sections 143, 144 and 230 of the Environmental Management Act, concern soil pollution and soil quality standards and provide with respect to a soil protection permit and compliance system. They also concern measures of enforcement. The object of these Regulations is to

- Set limits for soil contaminants in agriculture and habitat;
- Enforce minimum soil quality standards prescribed by the National Environmental Standards Committee.

Also, the regulations require that, the contaminants of volatile organic compounds in habitat and agricultural soils shall comply with parameters and upper limits as prescribed and contaminants of heavy metals in habitat; agricultural soils shall comply with parameters and upper limits as prescribed and contaminants of pesticides in habitat and agricultural soils shall comply with parameters and upper limits as prescribed. Local government authority may prescribe special or specific measures and guidelines for soil conservation applicable to their respective areas of jurisdictions which are not below standards prescribed under these Regulations. The Project developer will comply with the requirements made under these regulations.

3.3.10 Occupational Health and Safety Act 2003

The provisions of this law require employers to provide decent working environment to employees to guarantee their health and safety. Occupational health and safety services are important for sustainable development of a country, as they reduce occupational accidents and diseases which can have huge economic burden to individuals, enterprises and the nation as whole. Improving health and safety of workers will significantly increase productivity at the workplaces to encourage more investments, increase job creation, higher morale, and job satisfaction hence industrial harmony. The law also entails employers to fulfil obligations of ensuring safety of the equipment's used by workers and providing proper safety gears as required.

3.3.11 Water Supply and Sanitation Act No. 5 of 2019

This is also a new legislation that provides for sustainable management and adequate operation and transparent regulation of water supply and sanitation services; provides for establishment of water supply and sanitation authorities as well as community owned water supply organizations; and provides for appointment for service providers. The main aim of this law is to ensure the right of every

Tanzanian to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account among others protection and conservation of water resources and development and promotion of public health and sanitation; and protection of the interest of customers. Under this law, the Minister responsible for water affairs shall establish water authority and cluster water authorities in order to achieve commercial viabilities.

3.3.12 Engineers Registration Act and its Amendments 1997 and 2007

The Acts regulate the engineering practice in Tanzania by registering engineers and monitoring their conduct. It establishes the Engineering Registration Board (ERB), the law requires any local or foreigner engineer to register with ERB before practicing in the country. Project developer will continue to comply as it has utilized the services of registered engineering firm for its structural designs which it will continue to use to supervise the construction process.

3.3.13 Contractors Registration (Amendment) Act, 2008

The Contractors Registration Act requires contractors to be registered by the Contractors Board (CRB) before engaging in practice. It requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. Project Developer shall comply with the law requirement during the recruitment of contractors for project implementation.

3.3.14 Architects and Quantity Surveyors Act (1997)

The Act requires Architects and Quantity Surveyors to be involved in the project to be registered by the Architects and Quantity Surveyor Board (AQSB) before engaging in practice. It also requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. Project Developer has complied with the law requirement during the recruitment of architects who have designed the project and will continue to utilize registered persons in the project implementation.

3.3.15 Urban Planning Act (2007)

The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. Under Section 3, among others the law seeks to improve level of the provision of infrastructure and social services for sustainable human settlement development. This act established planning authorities which include the city, municipal, town and township councils in the country which have responsibilities including:

- Secure the orderly and environmentally sustainable development of area under its jurisdiction;
- Prepare general and detailed planning schemes;
- Control building densities and access to buildings;

- Recommending approval of building schemes and subdivision of plots by developers;
- Secure cooperation of all agencies, utility bodies, land owners and other bodies and institutions involved in the preparation and implementation of planning process;

3.3.16 Public Health Act (2009)

Provide for the promotion, preservation, maintenance of public health with a view to ensuring the provisions of comprehensive, functional and sustainable public health services to the general public. Part III (e) of the act requires premises owners to keep their premises free of mosquitoes and other disease vectors, vermin or causative agents; Section 54 prohibits causing or suffering from nuisance likely to be injurious or dangerous to health, land, premises, air or water; Part IV (c) assigns responsibility to City council to remove or appoint an agent to collect, transport and dispose solid and liquid waste and charge fees to beneficiaries of this service and responsibilities for prescribing types of wastes and guidelines for their collection and disposal; Section 101 it gives rights to any private sewer to connect it to any available public sewer to discharge foul or storm water therefore the project may connect to and discharge sewage or storm water into the available trunk main. However, the quality of the sewage should be as per agreed with the water authority.

The Contracting Authority will ensure that the project design, construction and operation does not constitute a nuisance; meets the requirements meets public health requirements.

3.4 World Bank Environmental and Social Safeguards

The Off-grid Sanitation Project is funded by the World Bank and must comply with its Safeguard policies. The following safeguard policies are particularly relevant:

Table 3-1: World Bank Environmental and Social Safeguards

Policy Code	Policy Title	Relevance to the Project	Remarks
OP/BP 4.01	Environmental Assessment	Applicable	Required due to potential environmental impacts from excavation, pipe line installation, noise, odor, dust, and wastewater handling. ESIA and ESMP must be prepared.

OP/BP 4.12	Involuntary Resettlement	Not Applicable	May be triggered if land acquisition, temporary displacement of vendors, or loss of access to livelihoods or property occurs. RAP may be required. No resettlement or land acquisition
OP/BP 4.11	Physical Cultural Resources	Not Applicable	There is no any cultural or religious resources at site
OP/BP 4.04	Natural Habitats	Not Applicable	The project is in a sparsely built peri-urban area, with no known sensitive habitats nearby.
OP/BP 4.36	Forests	Not Applicable	No forests are present or affected in the urban project area.
OP/BP 4.10	Indigenous Peoples	Not Applicable	No groups classified as Indigenous Peoples (under WB criteria) are present.
OP/BP 7.50	Projects on International Waterways	Not Applicable	Project does not abstract or discharge into international waterways. It is a local sewerage system limited to Mitamba area.
OP/BP 7.60	Projects in Disputed Areas	Not Applicable	Project site is not located in any legally disputed territory or border zone.

The main objective of this EMP is to establish a set of mitigation and monitoring measures to minimize the adverse social and environmental impacts that can take place during the implementation stage of the subproject. The measures especially focus on sensitive receptors or sensitive locations. The EMP also provides specific information about the monitoring program during construction stage including locations, frequency and reporting process. This project complies with these guidelines as it has ESMP which contains mitigation and monitoring plans of the identified impacts.

3.5 Institutional Framework

- **DAWASA (Dar es Salaam Water and Sewerage Authority)** – Project Implementing Agency responsible for planning, contracting, and overseeing sanitation infrastructure delivery.

- **NEMC (National Environment Management Council)** – Responsible for reviewing and approving the ESMP, conducting monitoring, and enforcing environmental compliance.
- **Ministry of Health (MOH)** – Provides policy oversight on sanitation and hygiene aspects.
- **Kibaha Municipal Council** – Provides local permits, supports community engagement, and ensures integration with local development plans.

CHAPTER FOUR

BASELINE INFORMATION

4.1 Introduction

This section provides baseline data on the relevant environmental characteristics of the project area in Kibaha Municipal Council, Coast Region. The description focuses on site-specific conditions relevant to the proposed Faecal Sludge Treatment Plant (FSTP), as well as broader environmental and socio-economic factors covering the wider Kibaha Municipality.

Data was obtained from primary field surveys, physical observation, and secondary sources, including the Kibaha Socio-Economic Profile (2019), Tanzania Meteorological Authority (TMA) data, and other literature on the Coast Region.

Kibaha's location along the Dar es Salaam–Morogoro highway and its proximity to Dar es Salaam City have made it one of the fastest-growing urban areas in Tanzania, attracting residential, commercial, and institutional development. The rapid population growth and increased waste generation have made improved sanitation infrastructure such as the proposed FSTP a critical necessity.

4.2 Physical Characteristics

Kibaha Town Council is one among the seven Councils of Coast Region; it also headquarters of the Region. The council is 40 km away from Dar es Salaam City. It is bordered by Kinondoni District to the East, Bagamoyo to the North, Kisarawe South and the Small Town of Mlandizi at North. The Council has an estimated area of 750 square Kilometers and lies between latitude 6.8° South and longitude 38.2° and 38.5° East. It is directly linked with Bagamoyo Town by seasonal road, while connection to other District Headquarters such as Kisarawe, Mkuranaa, Kilindoni (Mafia) and Utete (Rufiji) area accessible through Dar es Salaam City.

4.2.1 Climate

Kibaha Municipality experiences a modified equatorial coastal climate similar to Dar es Salaam, though slightly less humid due to its inland position (~40 km from the coast). The Town experiences hot and sunny weather throughout the year, with maximum temperature in December while minimum temperatures occur in July. The Town experiences three distinct seasons; dry season extending between May and October and two rain seasons. The first season is between November and December and the second one between March and April. The annual rainfall ranges from 700mm. For the past five consecutive years, there was inadequate rain which resulted into shortage of food

- **Temperature, Sun Hours, and Radiation**
    - Average annual temperature: 28–29°C.
    - Hottest season: October to March, with peak temperatures reaching 31°C.
    - Coolest period: July to September, with minimum temperatures around 20°C.
    - Average annual solar radiation: ~20 MJ/m²/day, with a maximum of 23–24 MJ/m²/day in October and a minimum of ~16 MJ/m²/day in April.
    - Maximum sun hours: ~9 hours/day (August–October); minimum: ~5 hours/day (April).

This climate profile means high evaporation potential beneficial for sludge drying processes in the FSTP while seasonal variation may affect water availability for certain operations.

- **Wind Speed**
    - Average annual wind speed: ~5–6 m/s.
    - Strongest winds: June–August, predominantly from the South-Southeast (SSE), associated with the south-east monsoon.
    - Calmest winds: December–March, during the north-east monsoon.
    - Wind direction is a key consideration for managing potential odor dispersion from the FSTP especially during influent loading.
- **Rainfall**
    - Bimodal rainfall pattern:
        - Long rains: March–May
        - Short rains: October–December
    - Average annual rainfall: 1,000–1,200 mm.
    - Rainfall intensity influences storm water management requirements for the FSTP site.

4.2.2 Soil, Geology, and Hydrogeology

- **Hydrology**
  The project site is within a developed urban setting in Kibaha Municipality. Surface runoff drains into roadside storm-water channels and eventually into seasonal streams or infiltration zones. No permanent river exists in the immediate vicinity of the proposed site, but shallow groundwater is present and accessed through boreholes and shallow wells in surrounding settlements.

- **Soils**
  Soils in Kibaha are generally sandy loams, with moderate infiltration capacity. The sandy texture allows for good percolation, though it is prone to erosion during intense rainfall events. Upper layers often contain moderate humus, supporting vegetation cover.

4.2.3 Topography

The project site lies in relatively flat terrain, characteristic of the Kibaha lowlands.

- Elevation: approximately 90–95 m Above Mean Sea Level (AMSL).
- Natural slope is gentle, draining towards the southeast, which is important for storm-water and effluent flow management in the FSTP design.

Flood Risk Assessment

The proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba area, is located in a climatic zone characterized by bimodal rainfall patterns typical of coastal Tanzania. The area experiences seasonal heavy rains during the long rains (March-May) and short rains (October-December).

Meteorological data for Kibaha and surrounding coastal areas indicate average annual rainfall ranging between 900 mm and 1,200 mm, with peak monthly rainfall often exceeding 250 mm during the long rainy season. Increasing trends in short-duration high-intensity rainfall events have been observed in the Coast Region, contributing to localized flooding, particularly in low-lying and poorly drained areas. Topography of the Mitamba site indicates that the area is gently sloping with no major depressions that would encourage water ponding. The proposed plant footprint is situated above nearby seasonal drainage pathways and does not lie within a recognized floodplain. Preliminary site surveys show that the elevation of the project site is higher than adjacent seasonal water channels, thereby reducing the likelihood of riverine flooding.

The natural gradient supports surface runoff toward existing drainage lines without causing backflow into the proposed facility area.

There are no permanent rivers crossing the project site. However, seasonal surface runoff occurs during heavy rainfall. Community consultations and local government records did not indicate recurring major flood events directly affecting the proposed site. Minor temporary water accumulation has been reported in nearby low-lying zones but not within the designated plant footprint.

Soil conditions in the area consist predominantly of sandy clay loams, which provide moderate infiltration capacity. This reduces prolonged water stagnation but requires engineered drainage to manage peak storm water flows.

4.2.4 Air Quality

Ambient air quality in the proposed project area is generally good, as the location is away from heavy industrial zones. However, dust may be generated during the construction phase and from unpaved roads nearby.

Ambient air quality at the proposed Fecal Sludge Treatment Plant (FSTP) site located at Mitamba area, Lumumba Mtaa, Pangani Ward in Kibaha was assessed at three representative sampling points (S1, S2, S3). The monitoring was conducted under clear cloud weather conditions during daytime hours to represent typical ambient conditions in the project area.

The parameters monitored included particulate matter ($PM_{2.5}$ and PM_{10}), oxygen (O_2), carbon monoxide (CO), hydrogen sulfide (H_2S), carbon dioxide (CO_2), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2). The measurements were compared against the requirements of TZS 845:2019.

Table 4-1 Ambient Air Quality Results

Sampling Location	Weather Condition	PM2.5 (µg/m³)	PM10 (µg/m³)	O_2 (%)	CO (ppm)	H_2S (ppm)	CO_2 (ppm)	SO_2 (mg/m³)	NO_2 (mg/m³)
S1	Clear Cloud	61.4	94.2	20.9	0	0	418	0.004	0.08
S2	Clear Cloud	35.6	88.5	20.9	0	0	421	0.003	0.09
S3	Clear Cloud	47.2	90.7	20.9	0	0	419	0.005	0.07
TZS 845:2019 Limits		75	100	19.5–23.5	10	20	1000	0.5	0.38

- The ambient air quality at the Mitamba site is generally within the permissible limits of TZS 845:2019. PM_{10} concentrations are relatively close to the upper allowable limit, likely influenced by unpaved access roads, light vehicular movement, and natural dust re-suspension, particularly during the dry season.
- No detectable levels of hydrogen sulfide (H_2S) or carbon monoxide (CO) were recorded, confirming the absence of significant industrial emission sources at baseline. Carbon dioxide levels were within normal background atmospheric concentrations.
- Given that the project involves fecal sludge treatment, potential operational emissions such as odor (particularly H_2S) will require strict management through proper process control, regular desludging schedules, and adequate buffer zones.
- Continuous monitoring during construction and operation phases is recommended to ensure compliance and protect nearby receptors, especially residential areas within Lumumba Mtaa.

4.2.5 Noise and Vibration

The noise and vibration levels at the project site are rated negligible as the only source of noise at the project site are motor vehicles using the street feeder road adjacent to the project area.

Environmental noise levels at the Mitamba site were measured using an Integrating Averaging Sound Level Meter (Model Piccolo II, Class 2) in accordance with ISO standards. Measurements were conducted during daytime hours at five representative locations (P1–P5) around the proposed facility boundary and nearby sensitive receptors.

Table 4-2 Noise Levels at Mitamba

Sampling Location	LAeq (dBA)	LASmax	LASmin	LAS10%	LAS90%	Category of Area
P1	63.4	74.1	52.6	67.2	55.3	Residential
P2	58.9	70.8	46.5	61.4	49.8	Residential
P3	60.7	72.3	48.9	64.5	51.7	Residential
P4	65.1	78.4	50.1	69.2	54.6	Mixed Use
P5	62.8	76.9	49.7	66.8	52.9	Residential

- The recorded noise levels ranged between 46.5 dBA and 78.4 dBA during measurement intervals.
- The measured baseline noise levels at Mitamba are generally within acceptable limits for residential and mixed-use settings. The dominant noise sources observed during monitoring included light vehicular traffic, wind movement through vegetation, occasional motorcycle activity, insects, and community activities.
- The background noise levels (LA90) indicate that the area currently experiences relatively low to moderate environmental noise, characteristic of peri-urban settings within Kibaha Town Council.

4.2.6 Relevance to the Project

The climatic conditions notably high solar radiation, bimodal rainfall, and warm temperatures are favorable for sludge drying and pathogen die-off. However, wind direction and seasonal rainfall must be factored into odor management, drainage, and storm-water control measures for the FSTP.

4.3 Biological Characteristics

4.3.1 Flora and Fauna

- Vegetation at the site is largely modified and influenced by human activities. The area consists mainly of open grassland, scattered shrubs, and a few

isolated trees. Some fruit trees such as mango and coconut were observed in surrounding residential plots. The vegetation is typical of peri-urban environments and does not represent natural forest habitat. No threatened, rare, or protected plant species were identified within the project footprint during the survey. Vegetation cover is generally sparse to moderate and shows signs of grazing and land use disturbance. Any vegetation clearance required for construction will be minimized to the footprint area only, and disturbed areas will be reinstated or landscaped after construction.

- Faunal presence within the project area is characteristic of a peri-urban setting. Observed species included common birds, grazing livestock such as cows, small reptiles, rodents, and insects. The presence of cows reflects ongoing community land use and grazing activities within open plots. No endangered, protected, or ecologically sensitive wildlife species were recorded during the field survey. The species observed are common and well adapted to human-modified environments. No wetlands, breeding habitats, or wildlife corridors were identified within the project site

4.4 Socio-Economic Set-Up

4.4.1 Administrative Boundaries

Kibaha Municipal Council is one of the six councils of the Pwani Region, located approximately 40 km west of Dar es Salaam along the Morogoro road. The municipality is administratively divided into 11 wards and 35 mitaa (streets). The proposed project site is located in Lumumba Mtaa, which is part of Pangani Ward in Kibaha Municipal.

Boarders:

- **North**: Bordered by Mlandizi area (Kibaha Rural)
- **South**: Bordered by Kongowe Ward
- **East**: Bordered by Maili Moja Ward
- **West**: Bordered by Picha ya Ndege area

4.4.2 Demographic Characteristics

Based on the 2022 National Population and Housing Census, Kibaha Municipal has a total population of 265,360 people, with Pangani Ward accounting for approximately 9,800 residents. Lumumba Mtaa itself has an estimated 1,200 residents living in about 250 households.

- **Gender ratio**: Approximately 96 males per 100 females (slightly higher female population).
- **Household size**: Average 4.8 persons per household.

- **Population growth**: High due to inward migration from Dar es Salaam and surrounding rural areas, driven by better economic opportunities and proximity to transport corridors.

The municipality is experiencing rapid urbanization due to spillover growth from Dar es Salaam, expansion of government institutions, and establishment of new industries.

4.4.3 Economic Activities

- **Primary Occupations**:
    - Informal trade (small shops, kiosks, street vending)
    - Formal employment in government institutions and private sector (nearby industrial zones)
    - Small-scale urban agriculture (vegetable gardens, poultry keeping)
- **Key Income Sources**: Retail trade, transport services (boda boda), daily wage labor, and service-based businesses.
- **Market Access**: Residents rely on nearby Kibaha Town market and smaller local stalls within Pangani Ward.

4.4.4 Social Services & Infrastructure

- ***Education***: One public primary school within Pangani Ward, secondary schools accessible in Kibaha Town.
- ***Health Services****:* Nearest health facility is Pangani Health Centre (~2 km from the site), with Kibaha Regional Hospital serving as the referral facility.
- ***Water Supply****:* Mainly from DAWASA piped water system, supplemented by household boreholes and water vendors during shortages.
- ***Sanitation****:* Predominantly pit latrines and septic tanks. No centralized sewerage network in Lumumba Mtaa, making the FSTP highly relevant.
- ***Road Access****:* The area is connected to the Morogoro road via feeder roads, most of which are gravel but passable year-round.

The above mentioned services are important receptors hence the project might affect through different exposure pathways: Potential pathways through which these sensitive receptors could be affected include:

- **Airborne Pathways:** Dust, odors, and emissions from construction activities or handling of fecal sludge could reach nearby schools, clinics, or residential areas.
- **Water Pathways:** Runoff from accidental spills or poorly managed drainage could enter local streams, drainage channels, or storm water systems, potentially exposing communities to contaminants.

- **Noise Pathways:** Construction machinery, sludge transport, or operational equipment may generate elevated noise levels that could affect nearby classrooms, healthcare settings, or residential areas.
- **Physical Safety Pathways:** Movement of sludge trucks and construction vehicles along public roads could pose traffic hazards to pedestrians, school children, and patients accessing health facilities.

CHAPTER FIVE

STAKEHOLDERS ENGAGEMENT

5.1 Introduction

Stakeholder engagement refers to a broad, inclusive, and continuous process to engage persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholder engagement enhances the effectiveness, efficacy, and accountability of the ESIA process and the project. When undertaken in a transparent, balanced manner, it can reduce conflicts and strengthen the sense of ownership of a project and the project's sustainability.

Stakeholder engagement often collaboratively identifies issues and options and helps make decisions based on input received via the stakeholder engagement process. Stakeholder engagement is a crucial part of the Environmental and Social Management Plan (ESMP) to ensure transparency, social acceptability, and community ownership of the FSTP Project in Mitamba area, Lumumba Mtaa. The engagement process follows World Bank Safeguard policy and national guidelines on public participation. Stakeholder's engagement was conducted twice (Internal meeting with local government authority and Public meeting) on 16th July and 17th July 2025, whereby the local leaders summoned a public Baraza and community was informed about the proposed project and their views were recorded as well as attendance which were attached in this report as appendix iii.

5.2 Objectives of Stakeholder Engagement

- To identify and involve stakeholders affected or likely to be affected by the project
- To collect concerns, feedback, and expectations from stakeholders
- To inform stakeholders about project scope, impacts, and mitigation measures
- To ensure stakeholder views are integrated into project design and implementation

5.3 Methods of Engagement

- Local leaders (Mtaa Leaders) internal meeting held in Lumumba Mtaa Office prior to public meeting/Baraza
- Public Consultative Meetings held at Lumumba Primary School
- Key Informant Interviews with local leaders and institutions
- Household Surveys to understand access and concerns regarding sanitation
- Information Dissemination via flyers, posters, and community boards

Table 5-1 Key Stakeholders Identified

Stakeholder Group	**Relevance**
Local community members (residents Lumumba Mtaa)	Directly affected by construction and operation
Local leaders (Mtaa & Ward leaders)	Represent community interests and mediate communication
DAWASA	Implementing agency responsible for design, construction, and operation
Ministry of Water (MoW)	Policy oversight and coordination
Local Government Authorities (Kibaha Municipal)	Land use, local infrastructure, grievance resolution
NEMC (National Environmental Management Council)	Regulatory and environmental compliance oversight
Community-Based Organizations (CBOs)	Local sanitation promotion and awareness

Table 5-2 Summary of Stakeholder Views and Responses

Name of the Stakeholder	**Issue Raised by Stakeholders**	**Project Response / Action**
Municipal EMO	- The Proposed FSTP project is of great benefits to Mitamba/Lumumba community and the Kibaha Municipal at large as it will improve sanitation - The project will reduce outbreak of diseases that might occur due to poor sanitation - The project will reduce cost for emptying the septic tanks - Continuous awareness to the community about	DAWASA will coordinate with CBOs and LGAs for community sensitization campaigns

	the project	
Town Planning Officer	- The land use is compatible with the proposed project - Land ownership document should be acquired as it is in process so follow up is recommended	DAWASA will make follow up to acquire title deed
Pangani WEO	- Employment opportunities to the local community especially the Youth in Pangani ward - The project will improve the sanitation status in Pangani ward and Kibaha Municipal at large - Community engagement in every stage/phase of the project.	Local Community will be first priority for employment opportunities Community engagement and awareness meeting will be conducted in all phases of the project
Lumumba Mtaa Leaders	- The Mtaa leaders accepted and supported the project as it will promote sanitation. - Contractor should follow and adhere the bylaws and cultures of the particular project area - The contractor must consult and inform Mtaa office on the employment opportunities and selection/interview to be done in collaboration with Mtaa leaders - Contractor must ensure good corporate Social responsibility (participating and supporting development programs whenever asked by the local leaders)	- Contractor will cooperate with Local Government in all project phases and will adhere the bylaws - Contractor will ensure good cooperation with local government and the local community at large.

Lumumba Community	- Employment opportunities to the local people especially youths and women, the man power is readily available in Lumumba Mtaa. - Training and seminar programs about the project. - Solid waste management practice should be considered, dustbins must be supplied in the construction site - Risk of foul odors during operation and desludging - If by any means there is a grievances who will be responsible to provide solution and reconciliation? -	- Employment priority will be given to the local people (For the works that needs unskilled labour) - Also Mama Ntilie will be sourced from the local area to vendor the food - There will be progressive community awareness programs on different matters concerning project - Contractor will provide waste collection bins and will cooperate with local government on the proper way for disposing the generated solid waste - The proposed project is totally covered hence no odor - There will be Grievance Redress committee which will also include members from the community, NGos and Local Government leaders. This GRM Committee will be responsible to register grievances and provide solution.

Grievance Redress Mechanism (GRM)

A Grievance Redress Mechanism (GRM) describe the procedures that will be followed to address grievances/complaints submitted by the people who may be impacted by or with interest to the project. The GRM will provide clarity and predictability on how grievances/complaints will be received, assessed, sorted, and resolved, and monitored. The central aim of the GRM will be to help reduce tension between the Contractor and affected communities and workers and to prevent unrealistic expectations or negative perceptions from the local population towards the Project.

The GRM will outline the following:

- Grievance Types; i.e. Project related issues
- Grievance Redress Committee Members and their contacts and reporting channels;
- Grievance Procedures

  -Grievance Uptake

  -Grievance Documentation

  -Acknowledgement and Response

  -Fast Tracking

  -Investigation of the Grievance

  -Grievance Resolution and Appeal

  -Grievance Closure
- Roles and Responsibilities for GRM Implementation;
- Grievance Management Timeframe;
- Internal and External Communication (linked to GRM)
- Schedule, Budget, Monitoring and Appeals procedures

The grievance redress procedure will ensure consultations with Complainant, Contractor, and other key relevant stakeholders and provides for record keeping to determine the validity of claims, and to ensure that solutions are taken in the most transparent and cost-effective ways. All workers and surrounding community members will be informed about the process for expressing dissatisfaction and how to seek redress.

Various channels for external stakeholders to air out their grievances formally shall include:

(i) **Using Grievance Form** – Stakeholder can complete a grievance form to be available at the Mtaa/Village and Ward Office and submit it to committee grievance desk.

(ii) **Face to face** - Stakeholders can voice their grievances to any member of GRC who will then escalate using the correct process.

(iii) **Use of Suggestion Box** – The workers /surrounding community members may use the Project opinion box to be placed at the Mtaa/Village Office and at the project site.

All received complaints must be recorded in a Complaints Log Book for future monitoring and reference

Complaints

Within 1 working day of receiving a complaint about any environmental issue, including pollution, supply a written report to the Engineer/Supervising Consultant detailing the complaint and action taken to alleviate the problem. Keep a register of all such complaints, together with the following records:

- Date and time of complaint
- The method by which the complaint was made (telephone, letter, meeting, etc.)
- Name, address, contact telephone number of complainant (if no such details were provided, a note to that effect)
- Details of complaint
- Action taken in response including follow up contact with the complainant
- Any monitoring to confirm that the complaint has been satisfactorily resolved
- If no action was taken, the reasons why no action was taken

Table 5-3 Roles and Responsibilities

Actor	**Responsibility**
DAWASA	Overall oversight, ensures functionality of GRM
Contractor	Receives and resolves construction-related grievances
Supervising Consultant	Monitors grievance process, validates reports, ensures compliance
Mtaa/Ward Offices	First-line community contact, helps register and escalate issues
GRM Committee	Investigates, proposes solutions, documents progress

Monitoring and Reporting

- A Grievance Register will be maintained by the contractor and reviewed weekly.
- Reports will be submitted monthly to DAWASA and shared with the Ministry of Water.
- Summary of grievances, trends, and resolution effectiveness will be included in the project's environmental and social monitoring reports.

CHAPTER SIX

6.1 POTENTIAL ENVIRONMENTAL IMPACTS

6.1.1 Introduction

This section outlines the process of impact identification and assessment of impacts in each stage of the proposal. The section also proposes mitigation measures that the project proponent is committed to undertake so as to prevent or reduce the identified impacts.

6.2 Impact Identification

The proposed project has a potential of causing a wide range of environmental and social impacts on a number of receptors. The ESIA identify these impacts for the purpose of mitigating the adverse ones or enhancing the benefits. Impact Identification is a process designed to ensure that all potentially significant impacts are identified and considered in the ESIA process. A number of tools are available to assist in impact identification. The simplest and most frequently used, checklist of impacts method was used for this project. Also, professional judgment based on experience from projects of similar nature and superimposing impacts prediction with the baseline conditions of the site and the surrounding areas including Kibaha Municipal Council in general was used in identifying impacts from the proposed project.

6.3 Potential Impacts

6.3.1 Positive Impacts

Employment opportunities for locals

The project will create job opportunities for local residents during both the construction and operational phases. Local youth and women from Lumumba Mtaa and Pangani Ward will be prioritized for unskilled and semi-skilled labor, boosting household incomes and improving livelihoods. Operational jobs in facility management, maintenance, and waste handling will provide long-term employment opportunities.

Improved public health and sanitation

The establishment of the FSTP will significantly improve public health by reducing the unsafe disposal of faecal sludge, which currently contaminates open spaces, drainage channels, and water bodies in Kibaha. By safely treating sludge, the facility will reduce the incidence of cholera, diarrhea, typhoid, and other waterborne diseases, thus improving the overall quality of life of the community.

Reduction in groundwater contamination

Currently, many households in Kibaha rely on septic tanks and pit latrines, which when improperly managed, allow effluent to infiltrate groundwater. The FSTP will provide a safe and centralized treatment option, thereby reducing risks of

contamination of boreholes and shallow wells that are critical sources of domestic water.

Resource recovery and reuse

The FSTP will support the production of valuable by-products such as compost manure and biogas. Compost will improve soil fertility and boost urban agriculture, while biogas can provide a renewable source of energy for cooking or electricity. This not only promotes circular economy practices but also reduces reliance on chemical fertilizers and fossil fuels.

Climate change mitigation

By capturing methane gas from sludge during treatment and converting it into biogas, the project will help reduce greenhouse gas emissions that would otherwise be released into the atmosphere through open dumping or poorly managed pit latrines. This contributes to Tanzania's climate change mitigation goals and global commitments.

Strengthening institutional capacity

The operation of the facility by DAWASA in collaboration with Kibaha Municipal Council will strengthen local institutional capacity in sanitation service delivery. Staff will gain new technical expertise in modern waste management and treatment technologies, improving overall governance in the sanitation sector.

Increased revenue collection

The FSTP will generate revenue for DAWASA and Kibaha Municipal Council through fees paid by desludging companies and service users. This revenue can be reinvested in improving sanitation infrastructure and other community services, supporting long-term economic development in Kibaha.

Promotion of environmental conservation

Proper treatment of sludge will reduce indiscriminate dumping in wetlands, rivers, and open spaces, thereby protecting ecosystems and biodiversity. Cleaner environments will also support greener urban development and improve the overall aesthetics of Kibaha Municipality.

Cost reduction for households and institutions

With an operational FSTP, households and institutions will have access to more affordable and reliable desludging services. This will reduce the financial burden of septic tank emptying, which is currently irregular and costly due to lack of formal treatment facilities.

Social cohesion and knowledge transfer

The construction and operation phases will promote interaction between technical experts, contractors, and the local community. This interaction will enhance

knowledge transfer on hygiene practices, safe waste handling, and modern technologies, encouraging behavioral changes that support sustainable sanitation.

6.3.2 Negative Impacts

Soil erosion due to land clearing

During the site preparation phase, clearing of vegetation and leveling of land will expose bare soil surfaces to the effects of wind and rainfall. This disturbance is likely to accelerate soil erosion, particularly during heavy rains, when sediments may be washed into nearby drainage systems and watercourses. Such erosion can lead to siltation, blockage of storm-water drains, and localized flooding. Additionally, the loss of topsoil reduces soil fertility and affects the long-term stability of the land, leaving it prone to further degradation.

Community concerns and opposition to the project

The siting of a fecal sludge treatment facility often generates resistance from local communities due to fears of foul odors, pollution of groundwater sources, and reduced property values. Residents around the Kibaha project site may worry that the facility will negatively affect their health, quality of life, and future land use options. Opposition may also arise if communities feel excluded from the planning and decision-making process, potentially leading to social conflict, delays, or reputational risks for project proponents.

Dust emissions from excavation and vehicle movement

Excavation, transportation of soil, and movement of heavy trucks within the project site will generate significant amounts of dust, particularly during dry seasons. Dust emissions may settle on nearby houses, crops, and vegetation, creating nuisance and discomfort for residents. Prolonged exposure to dust also poses health risks such as coughing, eye irritation, and aggravation of respiratory diseases like asthma. The impact will be most severe for vulnerable groups such as children, the elderly, and construction workers.

Noise pollution from machinery

The use of bulldozers, excavators, mixers, and generators during construction will create elevated noise levels that may disturb nearby households, schools, and businesses. Prolonged exposure to high noise can cause stress, loss of concentration, and even long-term hearing impairment in workers if not well managed. For the surrounding community, excessive noise disrupts normal social activities and reduces quality of life, especially if construction occurs during early mornings, evenings, or weekends.

Waste generation (construction debris, packaging)

The construction phase will generate large amounts of solid waste, including debris from excavation, cement bags, wooden planks, and scrap metal, and packaging materials. If not properly managed, these wastes may accumulate on-site, creating

hazards for workers and the community. Uncontrolled disposal of construction waste can block drainage systems, litter the surrounding environment, and attract disease vectors such as rodents and flies.

Oil/fuel leaks contaminating soil and water

Construction machinery and vehicles require fuel and lubricants, which pose a risk of leaks or accidental spills. Such spills can seep into the ground, contaminating soils and infiltrating groundwater sources used by the community for domestic purposes. Oil pollution also reduces soil productivity and creates long-lasting environmental hazards, as petroleum products are difficult to remediate once absorbed into the soil or water table.

Occupational health and safety risks for workers

Construction activities inherently involve risks such as falling objects, injuries from machinery, exposure to dust and noise, and accidents from working at heights. Without proper protective gear and safety protocols, workers face increased chances of occupational accidents and illnesses. Long-term exposure to untreated sludge during the operational phase also presents biological risks, including infections from pathogens and parasites.

Influx of workers causing social conflicts

The construction phase may require the recruitment of laborers from outside Kibaha, leading to an influx of non-local workers into Lumumba Mtaa and surrounding communities. This influx can strain local services such as housing, water supply, and sanitation, creating competition with residents. Cultural differences between workers and the host community may trigger misunderstandings or gender-based conflicts. Increased disposable income among workers may also lead to social vices, including alcohol abuse, gambling, and prostitution, which could accelerate the spread of HIV/AIDS and other sexually transmitted infections.

Traffic congestion and safety risks near site

The movement of trucks transporting construction materials and sludge to and from the facility will increase traffic volumes on access roads. This can result in traffic congestion, road damage, and higher risks of accidents involving pedestrians, cyclists, and school children. Poorly managed traffic flow may also obstruct normal community activities and emergency vehicle access.

Foul odors from sludge treatment processes

The treatment of fecal sludge inherently generates unpleasant odors due to the decomposition of organic matter. If not controlled, these odors may spread into surrounding neighborhoods, reducing community comfort and potentially leading to opposition against the facility. Persistent foul smells may also attract flies and discourage nearby land use development, contributing to negative perceptions about the project area.

Surface water and groundwater contamination from effluent leakage

If containment structures such as tanks, ponds, or pipes fail, untreated or partially treated sludge may leak into the soil and nearby watercourses. Contamination of surface water and groundwater can spread pathogens, increasing the risk of cholera, dysentery, and other waterborne diseases. This risk is particularly significant in Kibaha, where many households rely on shallow wells and boreholes for domestic water supply.

Vector proliferation (mosquitoes, flies, rodents)

Stagnant water in treatment ponds or poorly managed sludge can create breeding grounds for mosquitoes, while exposed organic matter attracts flies and rodents. The proliferation of these vectors increases the risk of malaria, dengue fever, cholera, and other vector-borne or hygiene-related diseases. For nearby residents, this presents a direct public health hazard and reduces community acceptance of the project.

Health risks to workers and nearby residents

Workers handling sludge will face significant exposure to pathogens such as bacteria, viruses, and parasites that cause gastrointestinal and skin infections. Without proper protective equipment and vaccinations, workers may contract occupational diseases. Nearby residents may also be exposed to health risks from accidental sludge spills, odor nuisance, or contamination of shared water resources.

Waste generation from dismantling

In the future, dismantling or decommissioning of the facility may generate large volumes of waste, including concrete rubble, scrap metal, and residual sludge. Improper management of this waste could pollute the environment and pose health risks to workers and nearby communities.

Soil and groundwater contamination from residual sludge

Residual sludge left on-site after decommissioning could seep into soils and contaminate groundwater aquifers. The long-term presence of heavy metals, pathogens, and organic pollutants in sludge makes it hazardous to ecosystems and human health if not carefully managed.

Loss of employment for workers

While the construction and operation phases will provide significant employment, the eventual completion of the construction phase or closure of the facility may result in job losses for many temporary workers. Loss of employment can create economic hardship for families who depended on wages from the project, especially if alternative jobs are not readily available.

Community safety risks during demolition

The dismantling or demolition of facility structures will involve the use of heavy machinery and manual labor, which poses risks of falling debris, machinery

accidents, and exposure to hazardous wastes. These activities may also endanger nearby communities if access to the site is not properly restricted during demolition works.

Impact of Sludge Truck Accidents and Spills

The proposed Fecal Sludge Treatment Plant (FSTP) will rely on vacuum tanker trucks for transportation of fecal sludge from septic tanks and pit latrines to the treatment facility. During transportation, there exists a potential risk of:

- Road traffic accidents involving sludge tankers
- Leakage due to mechanical failure or poor sealing
- Accidental discharge during loading/unloading
- Spills caused by tanker overturning

Although such incidents are expected to be infrequent, they may result in localized environmental contamination and pose risks to public health and community safety.

6.4 Project Alternatives

The analysis of project alternatives is a critical element of environmental and social assessment. It ensures that the selected option achieves project objectives while minimizing environmental and social risks. For the proposed FSTP, several alternatives were considered, including the "no-project" option, different locations, and different technology options.

6.4.1 Alternative 1: No Project Scenario

- **Description**: This option assumes that no intervention is made in Mitamba area, Lumumba Mtaa to address poor sanitation.
- **Implications**:
    - Continued reliance on unsafe on-site sanitation (e.g., poorly constructed pit latrines)
    - Increased risk of groundwater contamination and surface water pollution
    - Higher prevalence of waterborne diseases
    - Social and environmental degradation in a growing urban area

This option does not address urgent sanitation needs or public health risks.

6.4.2 Alternative 2: Alternative site

- **Description**: This involves identifying another location for the FSTP outside Lumumba Mtaa or even outside Pangani Ward.
- **Considerations**:

- It will be time consuming and additional cost
- Mitamba area in Lumumba Mtaa is under jurisdiction of Kibaha Municipal hence no compensation needed searching for alternative site could lead to compensation

6.3 Justification for Preferred Alternative

The chosen Fecal Sludge Treatment Plant (FSTP) in Lumumba Mtaa, Pangani Ward, Kibaha Municipal offers the best balance between cost-effectiveness, environmental protection, public health benefits, and community acceptance. Its hybrid low-energy treatment approach is well suited to Kibaha's municipal context, enabling efficient sludge management with minimal operational costs and low technical complexity.

The site's strategic location ensures easy access for desludging trucks, reduces haulage costs, and maximizes service coverage for both Kibaha and nearby urban centers. The project design minimizes land acquisition needs and avoids displacement, while generating local employment during both construction and operation phases.

This approach aligns fully with Tanzania's National Sanitation Campaign, the National Environmental Policy (2021).

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CHAPTER SEVEN

7.1 ENVIRONMENT AND SOCIAL MITIGATION MEASURES

7.2 Introduction

Mitigation Measures are "actions" to be applied in order to minimize or alleviate adverse impacts that may be caused by project implementation. A number of enhancement measures for positive impacts and mitigation measures for negative impacts are proposed hereunder. The positive benefits of the project will be maximized and any adverse negative impacts will be avoided or at least minimised/mitigated. The mitigation measures have been defined based on stakeholder input, expert analysis and opinion, experience with similar projects and best engineering practice.

Table 7-1 Environmental and Social Mitigation Measures for the potential Impacts

Impact	Type	Mitigation / Enhancement Measures
Soil erosion due to land clearing	Negative	- Limit land clearing to necessary areas only (Construction corridor only). - Conduct construction during dry periods where feasible. - Re-vegetate exposed areas as soon as possible.
Community concerns (More information about the project)	Negative	- Conduct continuous stakeholder engagement and awareness campaigns during and after project implementation. - Provide clear information on project benefits and odor control. - Establish a grievance redress mechanism. - Include community representatives in monitoring and site visits.
Dust emissions from excavation and vehicle movement	Negative	- Water spray exposed soil and roads to suppress dust. - Cover trucks transporting soil and materials. - Limit vehicle speeds within and around the construction site. - Provide PPE (dust masks, goggles) to workers.
Noise pollution from machinery	Negative	- Use well-maintained, low-noise machinery. - Limit construction to daytime hours. - Provide ear protection to workers.
Waste generation (construction debris, packaging)	Negative	- Segregate waste at source. - Store waste in designated containers. - Reuse or recycle construction materials wherever possible. - Dispose of non-recyclable waste at licensed dump sites in association with Kibaha Municipal Council Environmental Officers.
Oil/fuel leaks contaminating soil and water	Negative	- Store fuels and lubricants in secure, bounded areas. - Conduct regular maintenance of machinery. - Provide spill kits and train workers on spill response. - Avoid refueling near drains or water sources.

Occupational health and safety risks for workers	Negative	- Provide PPE (helmets, gloves, boots, and masks). - Conduct safety training and toolbox talks regularly. - Implement first aid stations and emergency response procedures. - Monitor workers' health and enforce safety protocols. Pre-medical examination, periodic medical examination and pre-exit medical examination should be conducted
Influx of workers causing social conflicts	Negative	- Recruit local labor as a priority. - Educate workers on local customs and code of conduct. - Establish liaison officers to handle disputes. - Provide accommodation and basic services for non-local workers.
Traffic congestion and safety risks near site	Negative	- Develop a traffic management plan. - Schedule deliveries during off-peak hours. - Install proper signage, speed limits, and traffic marshals. - Educate the community about construction traffic and safety.
Foul odors from sludge treatment processes	Negative	- Use covered tanks and enclosed treatment units. - Apply odor-neutralizing chemicals or bio-filters. - Implement regular sludge handling and timely processing. - Plant buffer vegetation around the facility.
Surface water & groundwater contamination from effluent leakage	Negative	- Design ponds, tanks, and pipelines to be leak proof. - Implement containment measures for spills. - Monitor water quality regularly. - Treat effluent to appropriate standards before discharge.
Vector proliferation (mosquitoes, flies, rodents)	Negative	- Cover sludge drying beds and control standing water. - Apply environmentally safe insecticides and rodent control measures. - Maintain hygiene and clean waste storage areas. - Encourage community awareness to prevent breeding outside the facility.
Health risks to workers and nearby residents	Negative	- Provide vaccinations and regular medical check-ups. - Supply PPE including gloves, masks, protective clothing. - Implement strict hygiene protocols. - Educate the community on safe water use and hygiene practices.
Waste generation from dismantling	Negative	- Plan dismantling in phases. - Segregate, reuse, and recycle demolition materials. - Dispose of hazardous materials at licensed facilities. - Monitor dismantling activities to prevent pollution and accidents.
Soil and groundwater contamination from residual sludge	Negative	- Ensure complete treatment of sludge before disposal. - Avoid storage of untreated sludge on bare soil.

		- Use lined storage facilities. - Conduct periodic monitoring of soil and groundwater quality.
Loss of employment for workers	Negative	- Provide skill training to workers. - Offer temporary redeployment to other projects. - Facilitate linkages with local employment agencies. - Encourage entrepreneurship among local youth.
Community safety risks during demolition	Negative	- Restrict site access to authorized personnel only. - Erect safety barriers and warning signs. - Provide PPE to workers. - Plan demolition activities to minimize exposure to nearby residents.
Employment opportunities for locals	Positive	- Prioritize hiring local residents. - Provide on-the-job training and capacity building. - Offer long-term operational roles. - Encourage women's participation in employment.
Improved public health and sanitation	Positive	- Ensure treated sludge meets quality standards. - Promote safe hygiene practices. - Conduct awareness campaigns on health benefits of safe sludge management.
Reduction in groundwater contamination	Positive	- Implement centralized sludge treatment. - Regularly monitor nearby wells and boreholes. - Maintain containment systems to prevent leaks.
Resource recovery and reuse	Positive	- Set up composting and biogas facilities. - Promote sale and use of compost manure for urban agriculture. - Use biogas for energy within the facility or community projects.
Climate change mitigation	Positive	- Capture methane for biogas production. - Monitor greenhouse gas emissions. - Adopt energy-efficient machinery and renewable energy where feasible.
Strengthening institutional capacity	Positive	- Train municipal staff in modern sanitation technologies. - Develop operational manuals and safety procedures. - Encourage knowledge sharing with other municipalities.
Increased revenue collection	Positive	- Implement structured fee collection. - Regularly audit revenue streams. - Reinvest revenue in local sanitation services.
Promotion of environmental conservation	Positive	- Prevent indiscriminate dumping by providing safe collection points. - Conduct environmental education for residents. - Maintain green buffer zones around the facility.
Cost reduction for households and institutions	Positive	- Offer affordable desludging services. - Provide incentives for households connecting to the FSTP. - Educate institutions about cost-effective sludge management practices.
Social cohesion and knowledge transfer	Positive	- Organize community workshops and facility tours. - Encourage partnerships between technical staff and residents for skill transfer.

CHAPTER EIGHT

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 Introduction

The Environmental and Social Management Plan (ESMP) presents the implementation schedule for the proposed mitigation measures to both environmental and social impacts as well as planning for long-term monitoring activities. The ESMP also includes the associated environmental costs needed to implement the recommended mitigation measures. The engineering designs have already included some of the mitigation measures recommended in this report. For instance, the use of shallow, small-diameter sewer pipes minimizes the need for deep excavations, thereby reducing risks of soil erosion, landscape disturbance, and property damage. Additionally, routing the pipes along road reserves and rear plot boundaries helps avoid major roads and private properties, which in turn reduces traffic disruptions and eliminates the need for relocation or compensation, However the disruptions are expected during construction and maintenance phase of which the setbacks are minor and can be solved through the proposed mitigations measures. Additional recommendations are provided in the ESMP to enable the proposed facilities become more environmentally friendly. The implementation steps will involve DAWASA, the contractor, Kibaha Municipal Council, some utilities providers such as TANESCO, and the local communities at large.

Table 8-1 provide the ESMP for the proposed construction of Fecal Sludge Treatment Plant to be constructed at Mitamba area, Lumumba Mtaa, Pangani Ward, and Kibaha Municipality.

Table 8-1: Environmental and Social Management Plan for Proposed construction of Feacal Sludge Treatment Plant to be constructed at Mitamba area, Lumumba Mtaa, Pangani Ward, Kibaha Municipality

Project Phase	Type of Impact	Potential Impact	Mitigation Measures	Frequency	Responsible Institution/Party	Estimated Cost (TZS)
Pre-Construction	Environmental	Vegetation clearance and disturbance of soil at the site	Minimize site clearance to only necessary areas; replant vegetation in buffer zones	Once before works start	Contractor/Kibaha Municipal Council	3,000,000
		Soil erosion due to land clearing	Provide proper drainage and soil stabilization	Monthly during site clearance	Contractor	4,000,000
	Social	Community concerns and opposition to project	Early stakeholder consultations, awareness creation, and disclosure meetings	Continuous during consultations	DAWASA / Kibaha Municipal Council	2,000,000
Construction	Environmental	Dust emissions from excavation and vehicle movement	Regular watering of unpaved surfaces; enforce speed limits	Weekly	Contractor	5,000,000
		Noise pollution from machinery	Use well-maintained equipment; restrict noisy works to daytime hours	Weekly, day & night	Contractor	4,000,000
		Waste generation (construction debris, packaging)	Provide waste bins, segregate waste, and dispose at approved sites	Weekly	Contractor / Kibaha Municipal	5,000,000

		Oil/fuel leaks contaminating soil & water	Use of oil containments, proper storage, and emergency spill kits	Monthly	Contractor	5,000,000
	Social	Occupational health & safety risks for workers	Provide PPE, safety training, and first aid facilities	Monthly	Contractor	15,000,000
		Influx of workers causing social conflicts	Employ local labor where possible; enforce code of conduct	Quarterly	Contractor / Kibaha Municipal/Lumumba Mtaa	5,000,000
		Traffic congestion and safety risks near site	Provide traffic signs, flag persons, and safe crossings	Monthly	Contractor	4,000,000
Operation	Environmental	Foul odors from sludge treatment processes	The proposed system will have odor control systems (bio-filters, covering units); maintain plant regularly	Monthly	DAWASA / Contractor / Plant Operator	8,000,000
		Surface water & groundwater contamination from effluent leakage	Ensure impermeable linings, routine effluent testing, and safe sludge disposal	After every 6 months	DAWASA / Contractor	10,000,000
		Vector proliferation (mosquitoes, flies, rodents)	Maintain hygiene, regular spraying, and sludge covering	Quarterly	DAWASA	10,000,000
	Social	Health risks to workers and nearby residents	Regular health checks, vaccinations, training on hygiene and safety	Quarterly	DAWASA	15,000,000

		Employment opportunities for locals	Prioritize hiring local staff for operation and maintenance	Annually	DAWASA / Kibaha Municipal Council	Included in O&M
Decommissioning	Environmental	Waste generation from dismantling	Proper waste segregation, recycling where possible, safe disposal at designated sites	Weekly during demolition	Contractor / Kibaha Municipal Council	10,000,000
		Soil and groundwater contamination from residual sludge	Safely remove and dispose remaining sludge before closure	Once before closure	Contractor / DAWASA	8,000,000
	Social	Loss of employment for workers	Provide alternative employment support or retraining	Once before closure	DAWASA / Municipal Council	12,000,000
		Community safety risks during demolition	Secure site, use barriers, and inform community of activities	During closure	Contractor	5,000,000
			TOTAL			**130,000,000**

CHAPTER NINE

ENVIRONMENTAL AND SOCIAL MONITORING PLAN

9.1 Introduction

Monitoring of the anticipated environmental and social risks and impacts in the receiving environments is important. It helps in determining the effects of the project activities on the environments enhancing understanding of cause effect relationships between human activities and environmental changes, and verifies the accuracy of prediction about the environmental impacts. It ensures compliance with regulatory measures and understanding the degree of implementation of EMP and its effectiveness. The monitoring results are also used extensively during the environmental auditing.

The Tanzanian EIA regulations require the developer to prepare and undertake a monitoring plan and conduct regular auditing. Monitoring is needed to check if and to what extent the impacts are mitigated, benefits enhanced and new problems addressed. Recommendations for monitoring have been included in the ESMP (Table 9-1). The ESMP also assigns responsibilities for monitoring activities. However, the divisional/ward/village environmental committees and municipal environmental committee will participate in the long-term daily monitoring of the project, especially during operation.

9.2 Monitoring Parameters

The selection of the parameters to be monitored is based on the high likelihood of occurrences of the selected parameters. Monitoring of these parameters will be done in various stages of the project as follows.

- Pre-construction stage – Monitoring of the parameters at this stage is meant to establish the baseline information of the target parameters in the project area.
- Construction stage - Monitoring at this stage is meant to establish the pollution levels that arise from the construction activities.
- Operation stage - Monitoring at this stage is meant to check on the impacts that might arise as a result of normal use of the infrastructure.
- Decommissioning - Decommissioning is not anticipated in the near future. However, if this were to happen, it may entail a change of use (functional changes) or demolition triggered by the change of land use.

Table 9-1: Environmental and Social Monitoring Plan for Proposed construction of Feacal Sludge Treatment Plant to be constructed at Mitamba area, Lumumba Mtaa, Pangani Ward, Kibaha Municipality

Project Phase	Type of Impact	Potential Impact	Monitoring Indicators / Parameters	Frequency	Limits / Standards	Monitoring Method	Responsible Institution	Estimated Cost (TZS)
Pre-Construction	Environmental	Vegetation clearance and disturbance of soil	% of vegetation cleared vs approved site plan	Once before works start	Clearance restricted to approved site boundaries	Site inspection, GIS mapping	Contractor / Kibaha MC	1,000,000
		Soil erosion due to land clearing	Evidence of erosion, siltation downstream	Monthly during site clearance	No visible uncontrolled erosion	Visual inspection, photos	Contractor	2,000,000
	Social	Community concerns & opposition	No. of grievances recorded & resolved	Continuous during consultations	100% grievances responded	Review of grievance log	DAWASA / Kibaha MC	3,000,000
Construction	Environmental	Dust emissions	PM10, PM2.5 levels (µg/m³)	Weekly	Minimum emission	Portable dust sampler, observation	Contractor	4,000,000
		Noise pollution from machinery	Noise level (dB)	Weekly, day & night	< 70 dB (day), < 55 dB (night) (WHO)	Sound level meter	Contractor	6,000,000
		Waste	Volume of waste	Weekly	100%	Weighbridge	Contractor /	5,000,000

		generation	collected & disposed (tons)		disposal at approved sites	records, inspection	Kibaha MC	
		Oil/fuel leaks	Presence of spills, hydrocarbon levels in soil/water	Monthly	Oil and Grease	Soil & water lab test	Contractor	5,000,000
	Social	Occupational health & safety risks	Number of accidents/injuries	Monthly	Zero fatalities, minimal incidents	OHS reports, inspection	Contractor	3,000,000
		Influx of workers & social conflicts	% of local vs external workers	Quarterly	local labor	Employment records	Contractor / Kibaha MC	5,000,000
		Traffic congestion & safety	No. of traffic incidents near site	Monthly	Zero serious accidents	Police reports, site logs	Contractor	4,000,000
Operation	Environmental	Foul odors	H_2S concentration (ppm), odor complaints	Monthly	minimal complaints	Air quality meter, survey	DAWASA / Plant Operator	8,000,000
		Effluent leakage (surface & groundwate	BOD_5, COD, TSS, pH, NH_3-N, NO_3^-, FC Heavy metals	Monthly	As per TBS/ effluent standards	Laboratory analysis	DAWASA / Contractor	6,000,000

		r)	(Pb, Cr, Cd, Hg)					
		Vector proliferation	Vector counts (flies, mosquitoes, rodents)	Quarterly	Declining trend	Inspection, traps, health reports	DAWASA	5,000,000
	Social	Health risks to workers & community	No. of reported cases (skin/respiratory/ enteric diseases)	Quarterly	Zero outbreaks	Health records, medical reports	DAWASA / Health Dept.	10,000,000
		Employment benefits	% of local workers employed	Annually	% of locals	HR records	DAWASA / Kibaha MC	O&M budget
Decommissioning	Environmental	Waste generation	Waste volume safely disposed (tons)	Weekly during demolition	100% disposal at approved sites	Records & inspection	Contractor / Kibaha MC	10,000,000
		Residual sludge contamination	Pathogen count, heavy metals in sludge	Once before closure	As per NEMC sludge disposal standards	Lab analysis	Contractor / DAWASA	8,000,000
	Social	Loss of employment	No. of affected workers & retraining programs	Once during closure	100% support to affected workers	Employment audit	DAWASA /	8,000,000

		Community safety during demolition	No. of reported accidents	Continuous	Zero accidents	Site inspection, incident logs	Contractor	5,000,000
	TOTAL							**98,000,000**

9.3 ESMP Implementation

9.3.1 Institutional Arrangements

The implementation of the Environmental and Social Management Plan (ESMP) for the Lumumba Fecal Sludge Treatment Plant (FSTP) Project will involve multiple institutions operating at different levels. The Ministry of Water (MoW) will provide oversight, while DAWASA will serve as the implementing agency under the Off-grid Sanitation Project funded by the World Bank. Effective coordination among environmental authorities, contractors, local government authorities (LGAs), and community stakeholders is essential to ensure compliance with environmental and social safeguards.

The institutional arrangement aims to assign clear responsibilities for ESMP implementation, monitoring, reporting, and grievance handling throughout all phases of the project.

Table 9-2 Roles and Responsibilities

Institution	Role in ESMP Implementation
Ministry of Water (MoW)	• Provides policy oversight and ensures ESMP aligns with national and World Bank standards • Supervises DAWASA and ensures safeguard compliance • Compile national-level reports on project performance, including environmental and social safeguards, to be shared with the World Bank and other partners.
DAWASA (Implementing Agency)	• Leads day-to-day implementation of the ESMP • Integrates ESMP measures into engineering contracts • Monitors and reports on safeguard performance • Engages with local authorities and communities
Contractor(s)	• Implements all on-site mitigation measures (e.g., dust suppression, noise control) • Ensures worker health, safety, and use of PPE • Reports incidents and safeguard performance to DAWASA
Local Government Authorities (LGAs)	• Support community mobilization and grievance resolution • Monitor social impacts and access disruptions
NEMC (Environmental Regulator)	• Provides technical oversight on environmental compliance • Conducts site inspections and reviews monitoring data • Enforces environmental regulations as needed

Communities / Stakeholders	• Participate in consultations and grievance redress • Provide local monitoring feedback • Engage in awareness programs on sanitation and health impacts

9.3.2 Coordination Mechanism

A project-specific Environmental and Social Safeguard Committee may be established at the DAWASA level to coordinate daily activities, reporting to MoW. Regular quarterly reviews will be held with participation from MoW, DAWASA, NEMC, contractors, and LGAs.

9.3.3 Capacity Building

Training will be provided to DAWASA, contractors, and LGA personnel on ESMP implementation, occupational health and safety, grievance redress mechanisms, and monitoring techniques.

9.3.4 Role and Responsibilities during ESMP Implementation

The Project Coordinator in the DAWASA office will be responsible for the overall monitoring and quality assurance of the Project. The project developer and the contractor shall be responsible for ESMP implementation; the Project coordinator will have a quality assurance and monitoring role including all safeguards aspects. The contractor will prepare and submit all safeguards progress and monitoring reports to the supervising Consultant who will later submit the reports to DAWASA. After internal scrutiny, DAWASA will submit the reports to Ministry of Water for further process.

Table 9-3 Role and Responsibilities during ESMP Implementation

Stakeholder	**Roles and Responsibilities**
DAWASA Project Coordinator	• Overall supervision and quality assurance of project implementation- Monitoring compliance with safeguards- Review and approve reports from Supervising Consultant- Submit consolidated reports to the Ministry of Water
Project Developer	• Ensure that the project is implemented in compliance with the ESMP- Coordinate with contractor and DAWASA on safeguards issues
Contractor	• Implement all ESMP measures on-site- Prepare regular safeguards monitoring and progress reports- Ensure workers comply with health, safety, and environmental measures
Supervising Consultant	• Receive and review safeguards reports from contractor- Provide technical oversight and compliance verification-

	Submit compiled reports to DAWASA
Ministry of Water	• Receive and archive reports from DAWASA- Provide guidance on compliance with national water and environmental policies- Liaise with NEMC and other relevant authorities if needed

CHAPTER TEN
CONCEPTUAL DECOMMISSIONING PLAN

10.1 Introduction

The conceptual decommissioning plan outlines the strategies that will be adopted at the end of the operational life of the Kibaha Faecal Sludge Treatment Plant (FSTP). Decommissioning involves the systematic closure, dismantling, and rehabilitation of the site to ensure that no long-term environmental or social risks remain. Although the project is expected to operate for several decades, advance planning is crucial to minimize potential adverse impacts during the closure phase and to facilitate the safe transfer of the site for alternative land uses. The conceptual decommissioning plan for the Kibaha FSTP demonstrates foresight in managing the eventual closure of the facility. By emphasizing environmental protection, occupational health and safety, and social safeguards, the plan ensures that decommissioning will be carried out responsibly. The ultimate goal is to restore the site for safe and productive future use while minimizing long-term environmental liabilities and safeguarding community welfare.

10.2 Objectives of Decommissioning

The primary objectives of decommissioning are to:

- Ensure safe dismantling and removal of treatment infrastructure.
- Prevent contamination of soil, groundwater, and surface water from residual sludge and construction materials.
- Protect the health and safety of workers and surrounding communities during demolition activities.
- Manage and dispose of waste materials in an environmentally sound manner.
- Restore the project site to a condition suitable for alternative beneficial uses, such as community facilities, open space, or industrial development.
- Minimize social and economic disruption to workers and the host community.

10.3. Key Decommissioning Activities

The decommissioning process will involve several steps, including:

10.3.1 Pre-Decommissioning Planning

- Conduct an environmental audit of the facility to determine the status of infrastructure, sludge, and potential contaminants.
- Prepare a detailed decommissioning schedule and risk management plan.
- Notify stakeholders, including the Kibaha Municipal Council, surrounding communities, and regulatory authorities, well in advance.

10.3.2 Decommissioning of Treatment Facilities

- Empty and treat all remaining sludge and wastewater to meet environmental discharge standards.

- Dismantle treatment tanks, drying beds, and mechanical equipment using appropriate demolition techniques.
- Decontaminate structures and pipelines prior to dismantling.
- Segregate reusable, recyclable, and non-recyclable materials for safe handling and disposal.

10.3.3 Management of Demolition Waste

- Reuse materials such as metals, concrete rubble, and plastics wherever possible.
- Dispose of hazardous waste (e.g., sludge residues, oils, and chemicals) in approved facilities.
- Prevent uncontrolled dumping to reduce risks of soil and water contamination.

10.3.4 Site Rehabilitation

- Backfill excavated areas with clean soil and compact them.
- Re-vegetate the site with indigenous plant species to restore ecological balance.
- Conduct soil and water quality monitoring to ensure no residual contamination.
- Prepare the land for potential alternative uses as directed by the Municipal Council.

10.4. Environmental and Social Considerations

- **Soil and Water Protection:** Prevent infiltration of contaminants into groundwater by lining residual sludge disposal areas and remediating contaminated soils.
- **Air Quality:** Suppress dust during demolition by applying water sprays.
- **Noise Management:** Restrict demolition activities to daytime hours and use noise-suppression equipment.
- **Occupational Health & Safety:** Provide workers with PPE, training, and emergency medical support.
- **Community Safety:** Restrict unauthorized access to the site, erect barriers, and communicate demolition schedules to nearby residents.
- **Social Impacts:** Provide counseling and alternative livelihood support for workers who may lose employment.

10.5. Institutional Responsibilities

- **DAWASA:** Lead agency for implementing decommissioning activities, ensuring compliance with national laws and donor requirements.
- **Kibaha Municipal Council:** Provide oversight, guidance on future land use, and monitor environmental compliance.

- **NEMC:** Regulate and approve decommissioning procedures, ensuring environmental standards are met.
- **Contractors:** Carry out demolition and rehabilitation activities in line with ESMP requirements.

10.6 Post-Decommissioning Monitoring

Post-closure monitoring will ensure that the site remains environmentally safe and socially acceptable. Activities will include:

- Periodic sampling of groundwater and soil to check for residual contamination.
- Inspection of vegetation growth and stabilization of rehabilitated areas.
- Regular engagement with local communities to address concerns related to land reuse.

10.7. Conceptual Cost Estimates

While detailed costing will be prepared closer to decommissioning, indicative cost categories include:

- Demolition and dismantling of infrastructure.
- Waste management and disposal.
- Environmental remediation (soil/water treatment, re-vegetation).
- Health and safety provisions.
- Community engagement and livelihood restoration.

Table 10-1 Cost estimate for decommissioning plan

Potential Impact	**Responsible Institution/Party**	**Estimated Cost (TZS)**
Demolition and dismantling of infrastructure	Contractor/Kibaha Municipal Council & DAWASA	10,000,000
Waste management and disposal	Contractor/Kibaha Municipal Council	8,000,000
Environmental remediation (soil/water treatment, re-vegetation).	Kibaha Municipal Council & DAWASA	10,000,000
Health and safety provisions	Contractor	5,000,000
Community engagement and livelihood restoration	Kibaha Municipal Council & DAWASA	8,000,000
TOTAL		**41,000,000**

CHAPTER ELEVEN

COST BENEFIT ANALYSIS

11.1 Overview

The objective of the cost benefit analysis for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba Area in Pangani Ward, Kibaha Municipal Council, is to evaluate the economic, environmental, and social benefits of the project in comparison with the resources required for its implementation. The analysis aims to translate the expected impacts of the project into measurable terms while recognizing that the project's capital investment occurs mainly during the construction phase, whereas the benefits accrue progressively throughout the operational life of the facility.

The proposed FSTP will play a critical role in improving fecal sludge management services within Kibaha Municipality by providing a designated facility for the safe treatment and disposal of sludge collected from septic tanks and pit latrines. The facility is expected to operate for an estimated design life of approximately 20 Years, during which time it will contribute to improved environmental quality, enhanced public health, and sustainable urban sanitation management.

In sanitation infrastructure projects, the key elements that can be evaluated include improvements in public health conditions, reduction of environmental pollution, operational and maintenance costs, infrastructure investment costs, and the long-term residual value of the treatment facility.

11.2 Benefits

Benefits of the proposed FSTP project represent the direct and indirect positive outcomes resulting from improved fecal sludge management within Kibaha Municipality and the nearby areas like some parts of Ubungo Municipal in Dar es Salaam region. Currently, inadequate sludge disposal practices may lead to contamination of water sources, public health risks, and environmental degradation. The construction and operation of the treatment plant will provide a regulated and environmentally sound solution for sludge management.

The anticipated benefits include improved sanitation services, reduction of environmental pollution, improved public health conditions, and strengthened municipal waste management systems.

The project will also contribute to improved environmental protection by preventing the uncontrolled discharge of fecal sludge into open areas, drainage systems, or water bodies.

11.3 Estimation of Benefits in Physical Terms

The key benefits expected from the implementation of the Mitamba FSTP Project include the following:

- Improved management and safe treatment of fecal sludge generated within Kibaha Municipality
- Reduction in environmental contamination of soil, groundwater, and surface water
- Improved public health through reduced exposure to pathogens associated with untreated sludge
- Enhanced sanitation services for urban and peri-urban communities
- Reduction of illegal dumping of fecal sludge in open environments
- Employment opportunities during both the construction and operational phases of the project
- Strengthening of municipal sanitation infrastructure and service delivery capacity

11.4 Physical Benefits into Economic and Social Value

While some benefits of sanitation infrastructure cannot be directly quantified in monetary terms, their economic and social value can be understood through improvements in environmental quality and public health outcomes.

Public Health Benefits: Improved fecal sludge management reduces the spread of waterborne and sanitation-related diseases such as cholera, diarrhea, and typhoid. This results in reduced healthcare costs and improved productivity within the community.

Environmental Protection Benefits: Proper treatment of fecal sludge prevents contamination of groundwater sources, rivers, and surrounding ecosystems. This protects natural resources that are essential for domestic water supply and ecological sustainability.

Operational Efficiency Benefits: The establishment of a centralized treatment facility improves the efficiency of fecal sludge collection services by providing a designated discharge point for vacuum trucks, thereby improving service delivery across the municipality.

Economic and Livelihood Benefits: The project will generate employment opportunities for skilled and unskilled workers during the construction phase and create permanent operational jobs related to plant management, maintenance, and sludge transportation services.

11.5 Project Costs

In economic terms, the cost of the proposed Fecal Sludge Treatment Plant (FSTP) investment represents the total value of resources required for planning, design, construction, operation, and maintenance of the facility throughout its lifecycle. These costs encompass infrastructure development, environmental and social safeguards implementation, and operational management of the treatment facility.

The total capital investment cost for the proposed Fecal Sludge Treatment Plant at Mitamba Area is estimated to be approximately Tanzania Shillings (TZS) 700,000,000, which will be financed by the World Bank through sanitation infrastructure support to the implementing agency DAWASA.

The investment cost will cover the construction of treatment infrastructure including sludge receiving facilities, treatment units, drying beds, drainage systems, site preparation works, access improvements, and supporting operational structures necessary for the functioning of the facility.

Environmental and Social Management and Monitoring Costs

Environmental and social safeguards form an integral component of the project implementation framework. Costs associated with the implementation of the Environmental and Social Management Plan (ESMP) and Environmental Monitoring Plan (EMP) have been included in the overall project budget.

These costs cover activities such as

- Implementation of environmental and social mitigation measures identified in the ESMP
- Environmental quality monitoring (water, air, and noise)
- Occupational health and safety management for project workers
- Community health and safety measures
- Stakeholder engagement and grievance redress mechanisms
- Periodic environmental reporting and compliance monitoring

The total estimated cost for implementing the ESMP and environmental monitoring activities throughout the construction and operational phases of the project is approximately Tanzania Shillings (TZS) 228,000,000.

These financial provisions ensure that environmental protection measures, social safeguards, and occupational health and safety standards are effectively implemented and monitored during the project lifecycle.

CHAPTER TWELEVE

12.1 CONCLUSION

The Environmental and Social Management Plan (ESMP) for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba Area under Kibaha Municipal Council, to be implemented by DAWASA, provides a structured and systematic framework for identifying, mitigating, monitoring, and managing environmental and social impacts associated with both the construction and operational phases of the project.

The ESMP outlines clearly defined mitigation measures, monitoring indicators, institutional responsibilities, reporting mechanisms, and budget allocations to ensure that all project activities are implemented in compliance with national environmental legislation and applicable international safeguard requirements. Through the effective implementation of the ESMP, adverse impacts such as soil erosion, surface water contamination, dust emissions, noise disturbance, occupational health risks, and temporary disruptions to nearby communities are expected to be reduced to acceptable levels.

However, despite the application of mitigation measures, certain residual environmental and social risks may remain. These include:

- Potential occasional odor emissions during peak sludge offloading or operational upset conditions;
- Increased traffic movement of sludge trucks along access roads, which may pose minor safety risks to local road users;
- Occupational exposure risks to workers handling sludge and treatment chemicals;
- Community perception risks or concerns related to stigma associated with sanitation facilities;
- Risk of accidental spills or system malfunction during extreme rainfall events linked to climate variability.

These residual risks are anticipated to be low to moderate in magnitude and manageable through continuous monitoring, adaptive management, and routine maintenance of treatment infrastructure, emergency preparedness planning, and sustained stakeholder engagement.

To address residual risks, the project will implement:

- Continuous environmental quality monitoring (air, water, noise, and effluent quality);
- Preventive maintenance and contingency planning for plant systems;
- Community grievance redress mechanisms;
- Ongoing occupational health and safety supervision;
- Periodic ESMP performance audits and reporting to relevant authorities.

Overall, the anticipated long-term benefits of the project including improved sanitation services, reduced indiscriminate sludge disposal, enhanced public health outcomes, environmental protection, and local employment opportunities significantly outweigh the identified residual risks.

APPENDIX I: LAND OWNERSHIP LETTER

JAMHURI YA MUUNGANO WA TANZANIA
OFISI YA RAIS
TAWALA ZA MIKOA NA SERIKALI ZA MITAA
HALMASHAURI YA MJI KIBAHA

Unapojibu tafadhali taja:

Kumb. Na. KTC/C/L.40/4/48 23/10/2024

Meneja,
Mamlaka ya Maji Safi na Usafi wa Mazingira (DAWASA),
S. L. P. 1573,
DAR ES SALAAM

YAH: KUPATIWA ENEO KATIKA MRADI WA UPIMAJI WA KIWANJA NAMBA 34 MITAMBA KATA YA PANGANI

Tafadhali husika na somo tajwa hapo juu.

2. Baraza la Madiwani la Halmashauri ya Mji Kibaha katika kikao chake cha kawaida cha baraza cha robo ya pili ya mwaka 2024/2025, kilichoketi tarehe **17/10/2024** limeridhia kuipatia Mamlaka ya Maji Safi na Usafi wa Mazingira Dar es salaam (DAWASA) eneo lenye ukubwa wa ekari sita (6).

3. Eneo hilo mtaoneshwa na mtakabidhiwa mara baada ya kukamilika kwa zoezi la upangaji na upimaji.

4. Nashukuru kwa ushirikiano wako.

Dkt. Rogers Jacob Shemwelekwa
MKURUGENZI WA MJI
KIBAHA

MKURUGENZI WA MJI
HALMASHAURI YA MJI KIBAHA

S. L. P 30112,KIBAHA PWANI, Simu +255 232402938, Nukushi + 255 232402007
1 Mtaa wa Halmashauri 61182 Kibaha CBD, Barua pepe: td@kibahatc.go.tz, Tovuti www.kibahatc.go.tz

APPENDIX II: SITE LAYOUT PLAN

LEGEND:

FEACAL SLUDGE AND SEPTAGE TREATMENT

1. FAECAL SLUDGE RECEIVING AND SCREENING UNIT
2. FAECAL SLUDGE SETTLING - THICKENING TANKS
3. DRYING BEDS
4. INTEGRATED SETTLER, ABR AND AF
5. PLANTED GRAVEL FILTER (PGF)
6. HYDROMECHANICAL SIPHON
7. VERTICAL SAND FILTER
8. SERVICE BUILDING
9. POTABLE WATER TANK AND TOWER
10. PUMP STATION
11. POLISHING POND
11. POLISHING POND
12. TREATED WASTEWATER PUMP STATION (SOLAR POWERED)
13. TREATED WASTEWATER TANK AND TOWER
14. SERVICE BUILDING - SEPTIC TANK
15. SOLID WASTE DRYING RACK

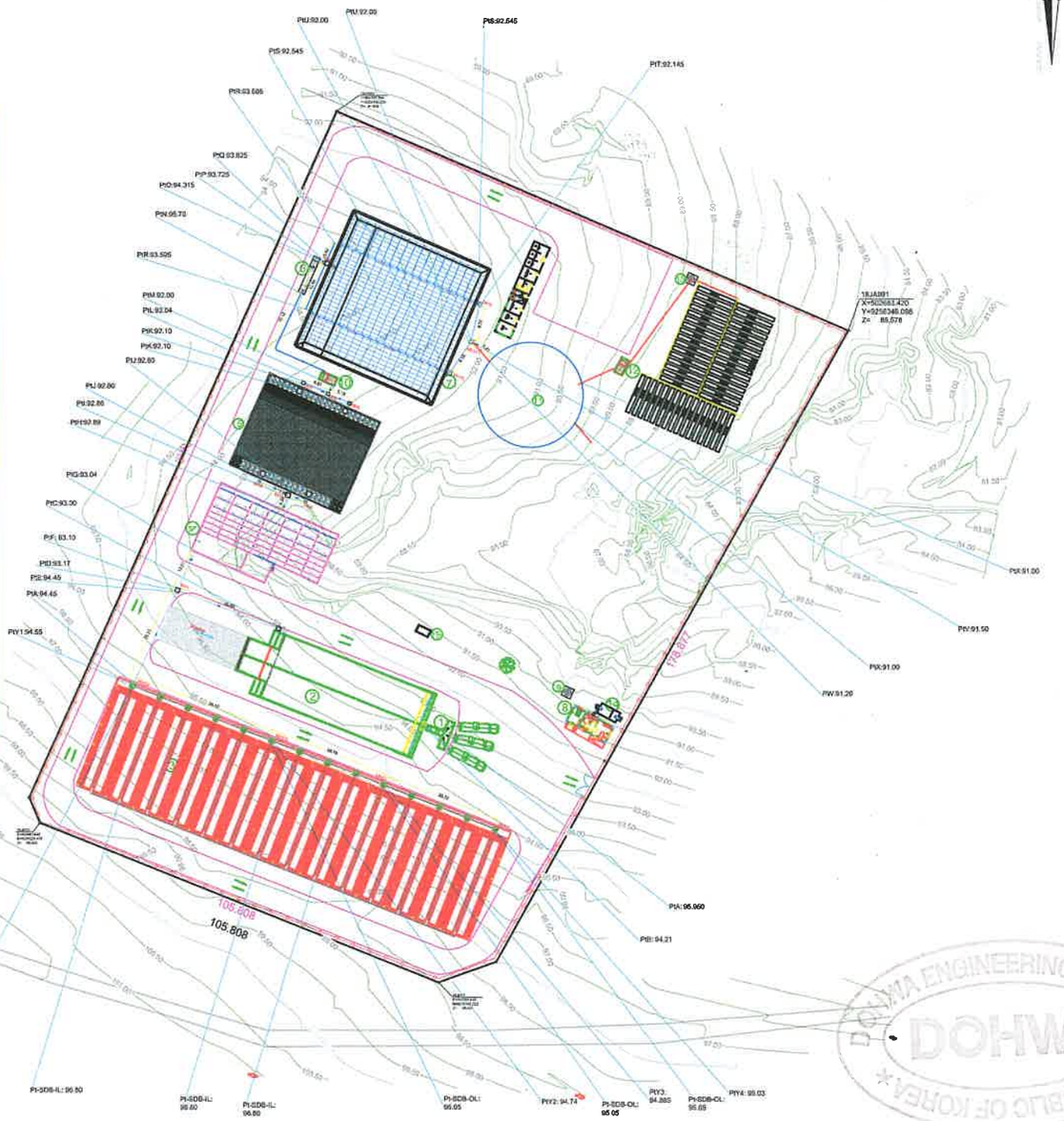
WASTEWATER/SLUDGE PIPE

EFFLUENT PIPE

ACCESS ROAD

RIVER/ STREAM/ DISCHARGE BODY

FENCE



LEGEND:

- Electric Pole
- Existing Road
- Trees
- Plot boundary
- Control Points

CLIENT

UNITED REPUBLIC OF TANZANIA

DAWASA
P.O.BOX 1573, DAR ES SALAAM

CONSULTANT

DOHWA

CONTRACTOR

SHANXI CONSTRUCTION ENGINEERING CORPORATION AND MINERAL COMPANY

PROJECT TITLE

CONSTRUCTION OF FAECAL SLUDGE TREATMENT PLANT (FSTP) AT MITAMBA SITE, KIBAHA-PWANI REGION

DRAWING TITLE

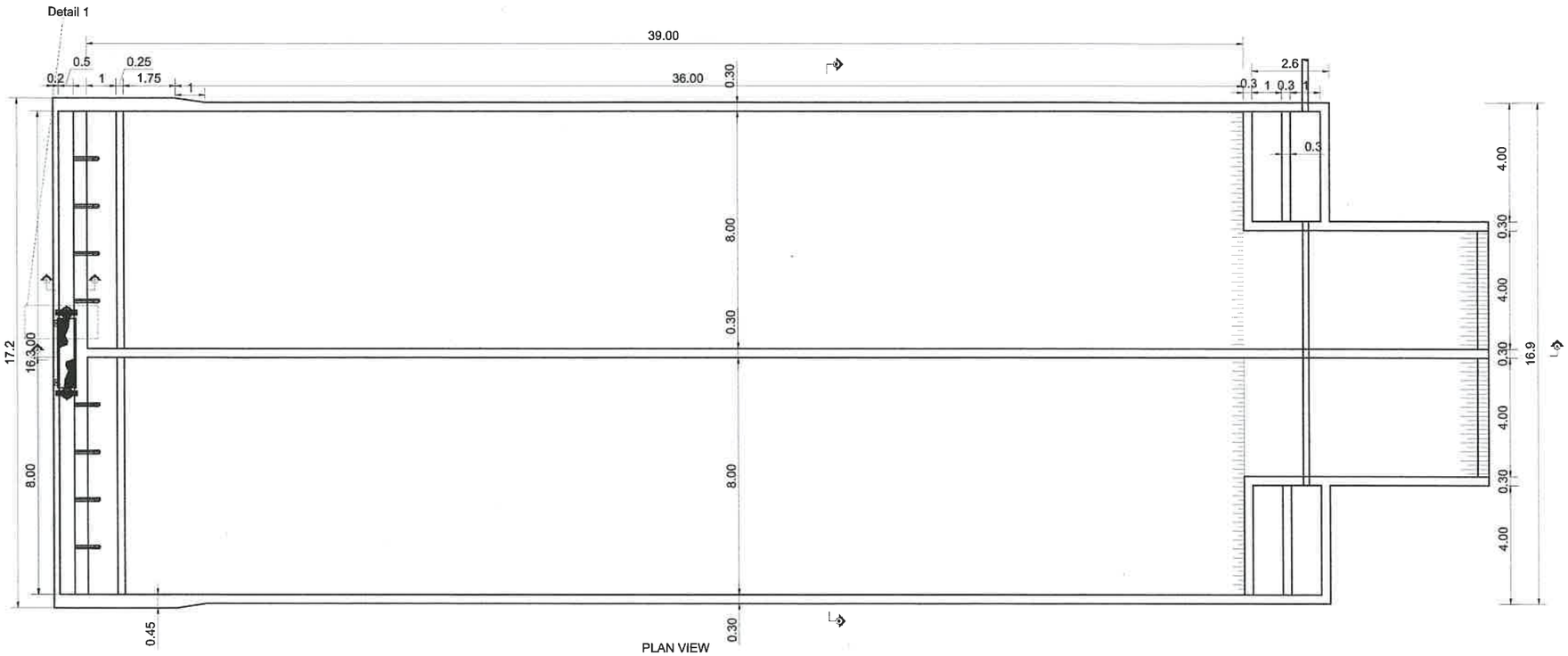
FSTP SITE LAYOUT PLAN WITH KEY INVERT LEVELS AT MITAMBA, KIBAHA IN PWANI REGION

DRAWING NO.

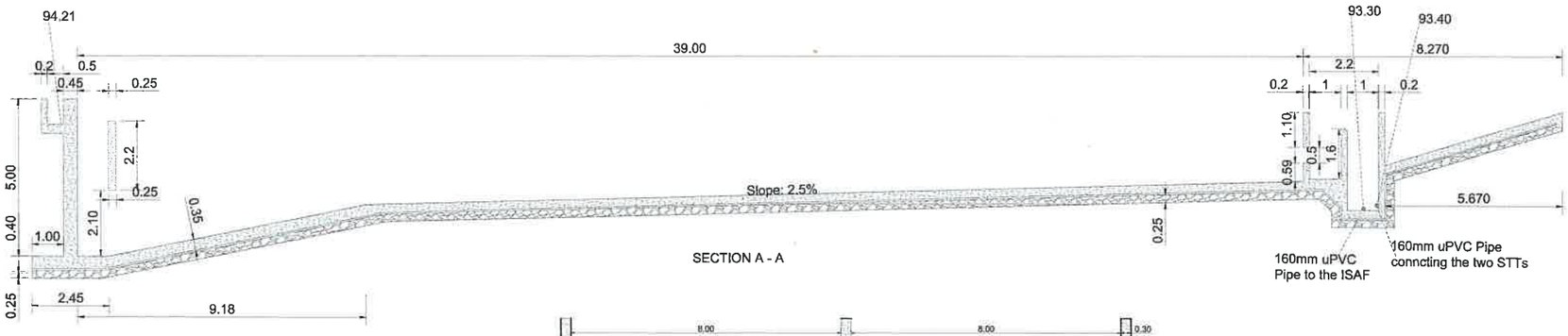
ACEMC - FSTP - KIBAHA - FSTP-001A

SCALE:	REV:	DESIGN BY:	DRAWN BY:
AS SHOW	DATE: 01/05/2025	CHECKED BY:	APPR. BY:

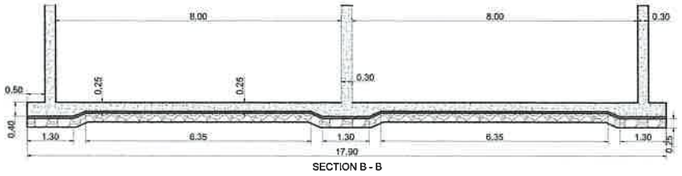
DOHWA ENGINEERING CO., LTD. REPUBLIC OF KOREA



PLAN VIEW



SECTION A - A



SECTION B - B

CLIENT

UNITED REPUBLIC OF TANZANIA

DAWASA
ISO 9001:2015 Certified

DAWASA
P.O.BOX 1573, DAR ES SALAAM

CONSULTANT

DOHWA

DOHWA Engineering Co., LTD,
P0 Box 9838,
Plot No. 418, Ocean Drive Residence, A2A,
Oyster bay, DSM, Tanzania

CONTRACTOR

SHANXI CONSTRUCTION ENGINEERING CORPORATION AND MINERAL COMPANY
Plot No.109 Ali Bin Said Road, Oysterbay
DAR ES SALAAM, TANZANIA
P.O.Box 106293 DAR ES SALAAM
MOBILE: +255787678370
Email: [illegible]

PROJECT TITLE

CONSTRUCTION OF FAECAL SLUDGE TREATMENT PLANT (FSTP)
AT MITAMBA SITE, KIBAHA-PWANI REGION

DRAWING TITLE

FSTP (220m³ size) MITAMBA KIBAHA, SETTLING -THICKENING TANK - PLAN VIEW AND SECTIONS

DRAWING NO.

SCEMC - FSTP - KIBAHA - FSTP-003

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AS SHOW	REV02		SHANXI
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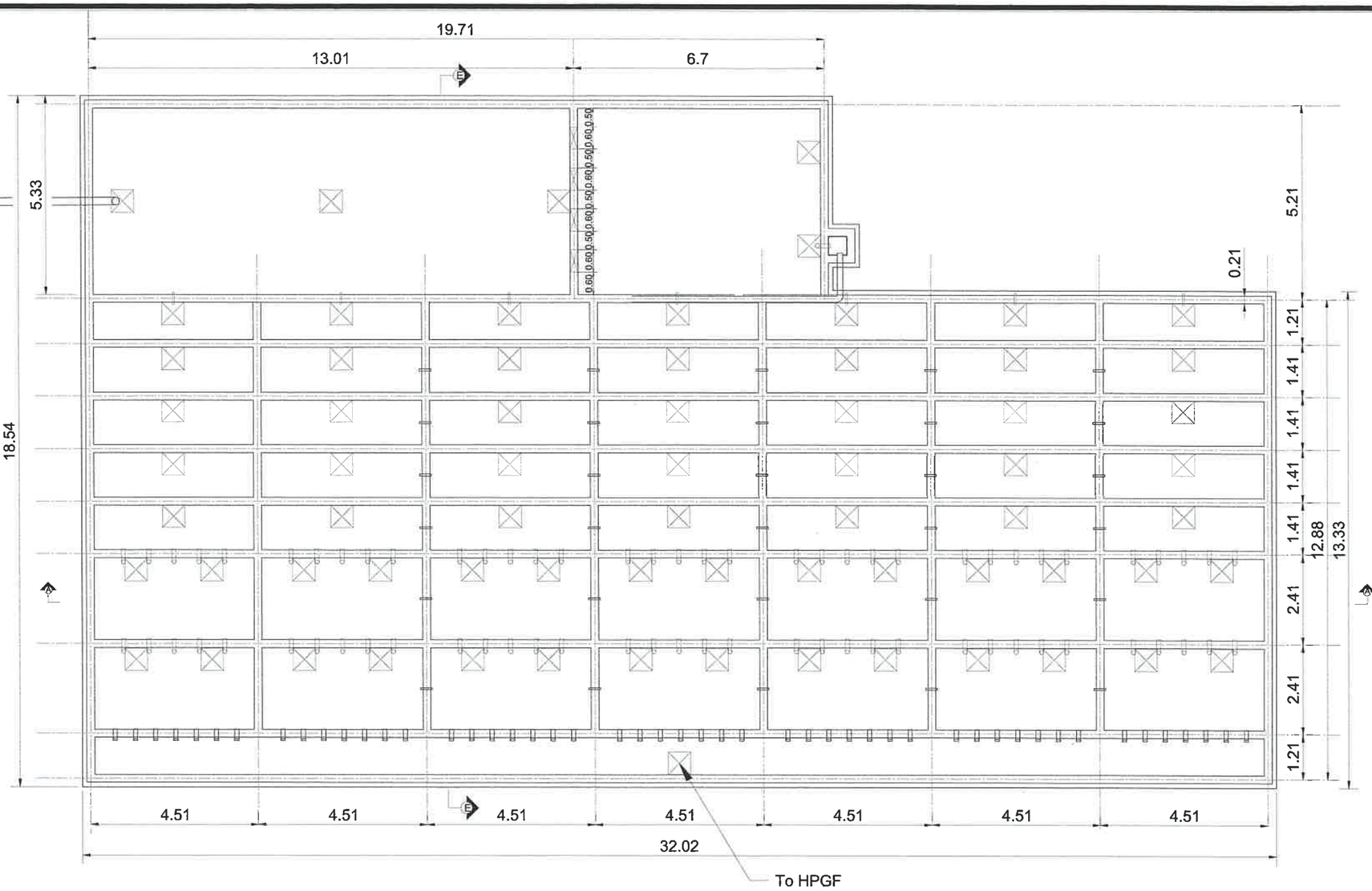

ABR PLAN VIEW

CLIENT

UNITED REPUBLIC OF TANZANIA

DAWASA
ISO 9001:2015 Certified

DAWASA
P.O.BOX 1573, DAR ES SALAAM

CONSULTANT

DOHWA

DOHWA Engineering Co., LTD.
P0 Box 9838,
Plot No. 418, Ocean Drive Residence, A2A,
Oyster bay, DSM, Tanzania

CONTRACTOR

SHANXI CONSTRUCTION ENGINEERING CORPORATION AND MINERAL COMPANY
Plot No 109 Ali Bin Said Road, Oysterbay
DAR ES SALAAM, TANZANIA
P.O.Box 106293 DAR ES SALAAM
MOBILE: +255787624378
Email: lvweie@sdcc.cn

PROJECT TITLE

CONSTRUCTION OF FAECAL SLUDGE TREATMENT PLANT (FSTP) AT MITAMBA SITE, KIBAHA-PWANI REGION

DRAWING TITLE

„FSTP (220m³ size) MITAMBA KIBAHA, INTEGRATED SETTLER - ABR AND ANAEROBIC FILTER - PLAN VIEW ARRANGEMENTS

DRAWING NO.

SCEMC - FSTP - KIBAHA - FSTP-005

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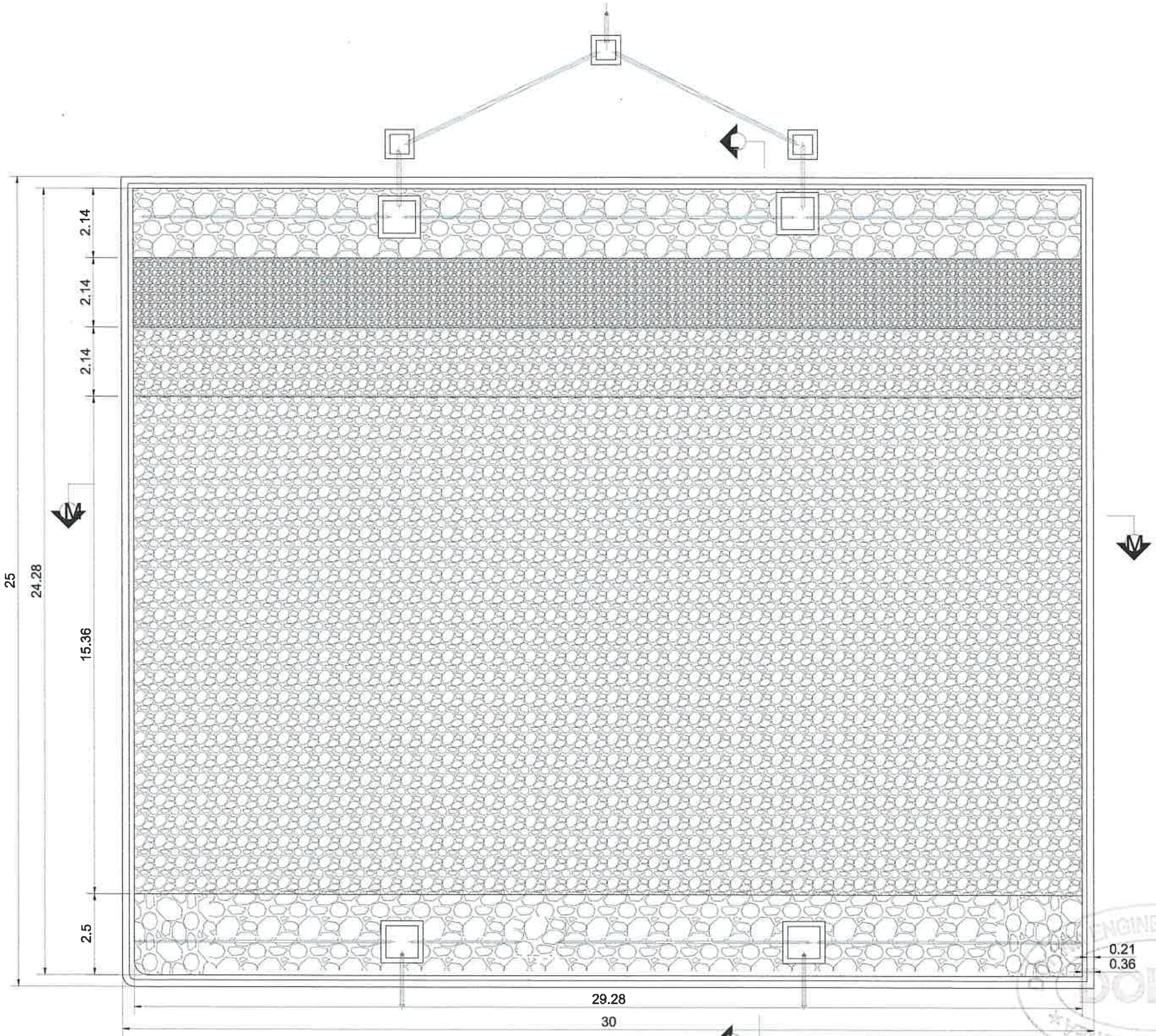

ABR PLAN VIEW

CLIENT

UNITED REPUBLIC OF TANZANIA

DAWASA
ISO 9001:2015 Certified

DAWASA
P.O.BOX 1573, DAR ES SALAAM

CONSULTANT

DOHWA

DOHWA Engineering Co., LTD,
PO Box 9838,
Plot No. 418, Ocean Drive Residence, A2A,
Oyster bay, DSM, Tanzania

CONTRACTOR

SHANXI CONSTRUCTION ENGINEERING CORPORATION AND MINERAL COMPANY
Plot No.109 Ali Bin Said Road, Oysterbay
DAR ES SALAAM, TANZANIA
P.O.Box 106293 DAR ES SALAAM
MOBILE: +255787628370

PROJECT TITLE

CONSTRUCTION OF FAECAL SLUDGE TREATMENT PLANT (FSTP) AT MITAMBA SITE, KIBAHA-PWANI REGION

DRAWING TITLE

FSTP (220m^3 size) MITAMBA KIBAHA, PLANTED GRAVELL FILTER (PGF) - PLAN VIEW

DRAWING NO.

SCEMC - FSTP - KIBAHA - FSTP-010

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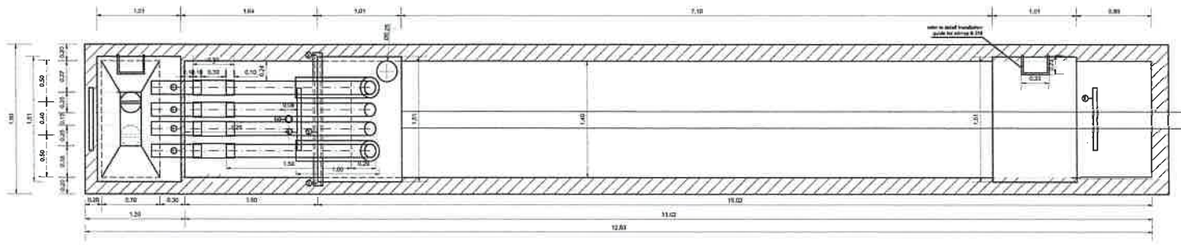
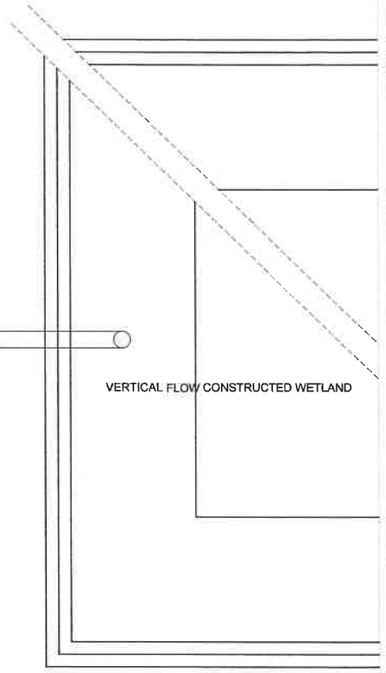
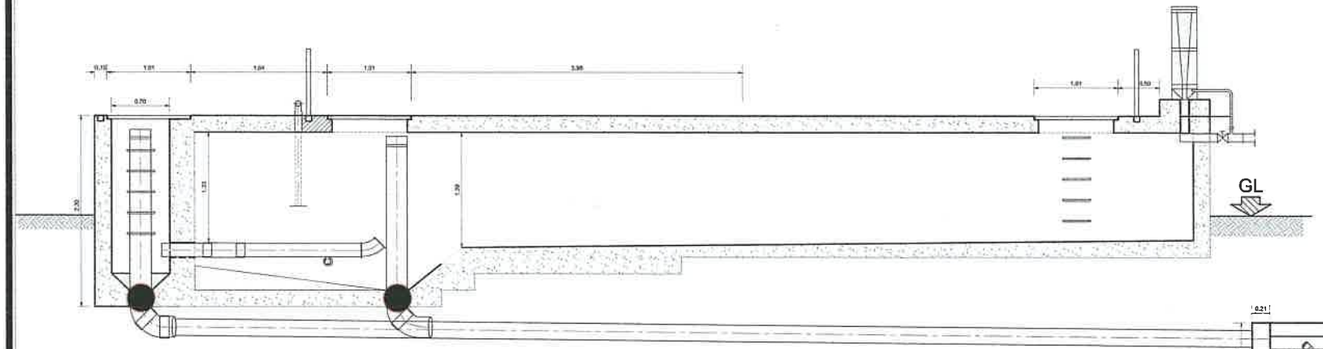
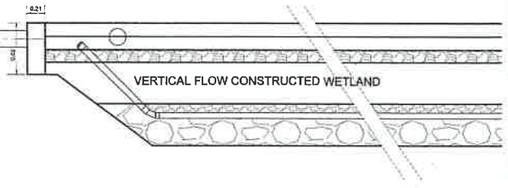


PLAN VIEW



VERTICAL FLOW CONSTRUCTED WETLAND





VERTICAL FLOW CONSTRUCTED WETLAND

CLIENT

UNITED REPUBLIC OF TANZANIA

DAWASA
P.O.BOX 1573, DAR ES SALAAM

CONSULTANT

DOHWA

DOHWA Engineering Co., LTD.
P0 Box 9838,
Plot No. 418, Ocean Drive Residence, A2A,
Oyster bay, DSM, Tanzania

CONTRACTOR

SHANXI CONSTRUCTION ENGINEERING CORPORATION AND MINERAL COMPANY
Plot No.109 Ali Bin Saki Road, Oysterbay
DAR ES SALAAM, TANZANIA
P.O.Box 106293 DAR ES SALAAM
MOBILE: +255787528370
Email: [illegible]

PROJECT TITLE

CONSTRUCTION OF FAECAL SLUDGE TREATMENT PLANT (FSTP) AT MITAMBA SITE, KIBAHA-PWANI REGION

DRAWING TITLE

FSTP (220m³ size) MITAMBA KIBAHA, HYDROMECHANICAL SIPHON- PLAN VIEW

DRAWING NO.

SCEMC - FSTP - KIBAHA - FSTP-013

SCALE:	REV02	DESIGN BY:	DRAWN BY: SHANXI
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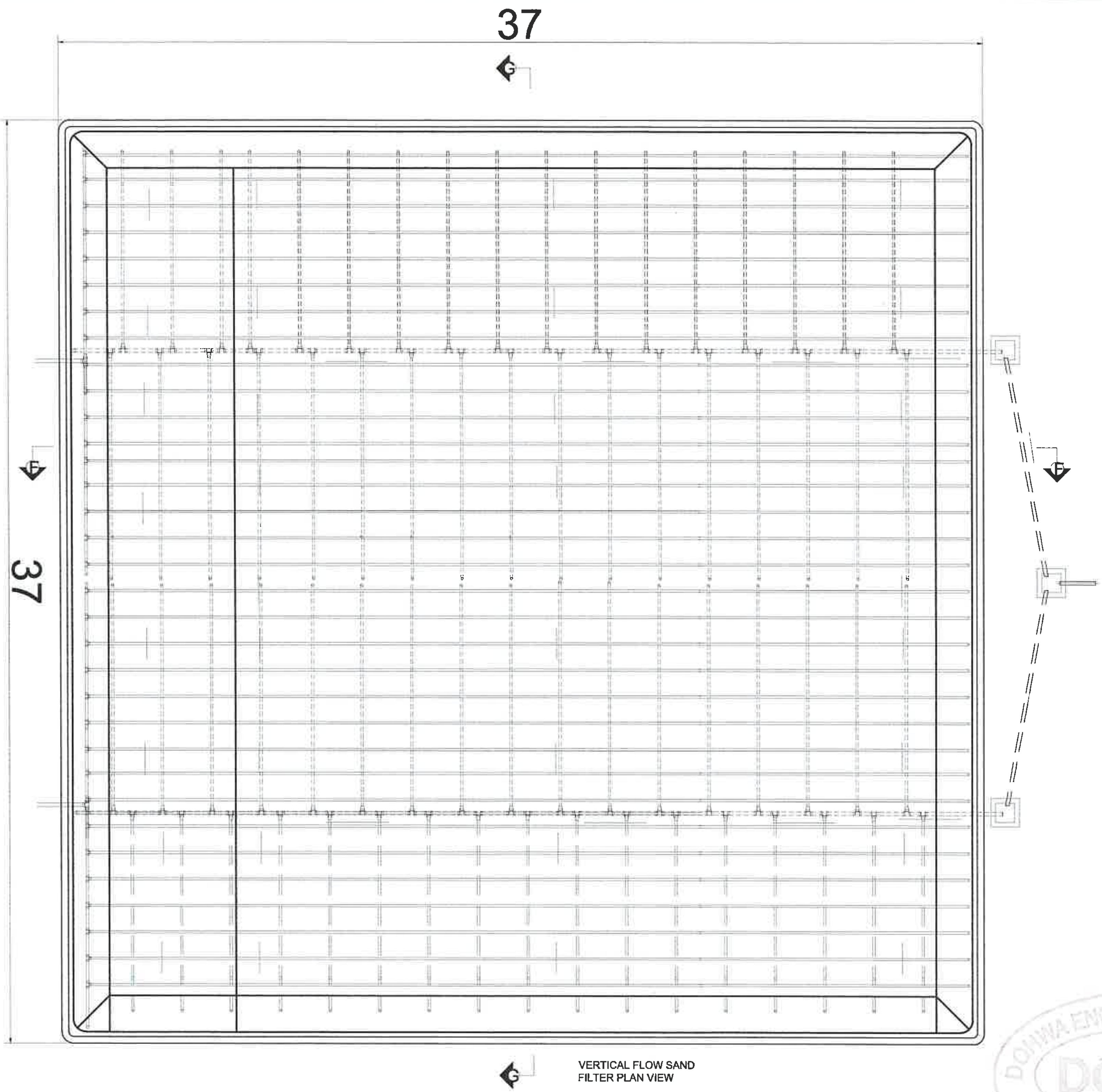
DOHWA ENGINEERING CO. DOHWA REPUBLIC OF KOREA



VERTICAL FLOW SAND FILTER PLAN VIEW

CLIENT

UNITED REPUBLIC OF TANZANIA

DAWASA
P.O.BOX 1573, DAR ES SALAAM

CONSULTANT

DOHWA
DOHWA Engineering Co., LTD,
Po Box 9838,
Plot No. 418, Ocean Drive Residence, A2A,
Oyster bay, DSM, Tanzania

CONTRACTOR

SHANXI CONSTRUCTION ENGINEERING CORPORATION AND MINERAL COMPANY
Plot No.109 Ali Bin Said Road, Oysterbay
DAR ES SALAAM, TANZANIA
P.O Box 106293 DAR ES SALAAM
MOBILE: +255787628370
Email: [illegible]

PROJECT TITLE

CONSTRUCTION OF FAECAL SLUDGE TREATMENT PLANT (FSTP) AT MITAMBA SITE, KIBAHA-PWANI REGION

DRAWING TITLE

FSTP (220m^3 size) MITAMBA KIBAHA, VERTICAL FLOW SAND FILTER- PLAN VIEW

DRAWING NO.

SCEMC - FSTP - KIBAHA - FSTP-014

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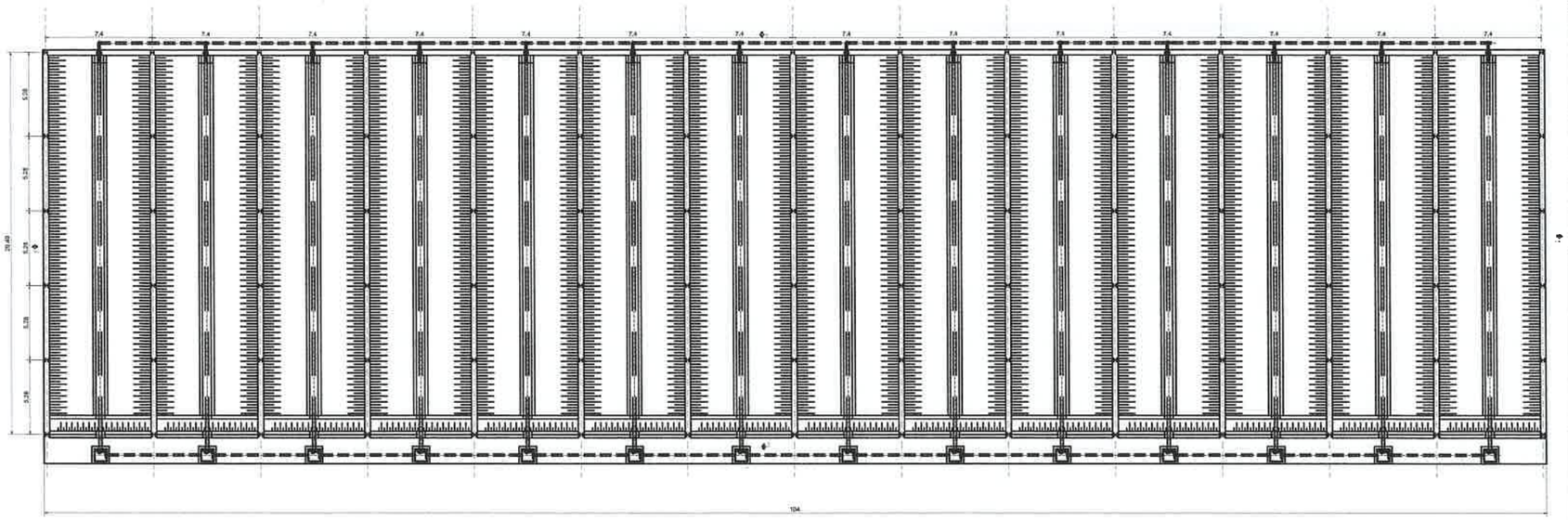
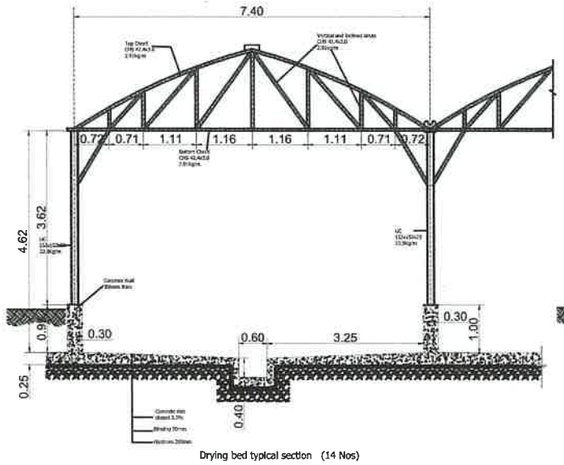


ABR PLAN VIEW



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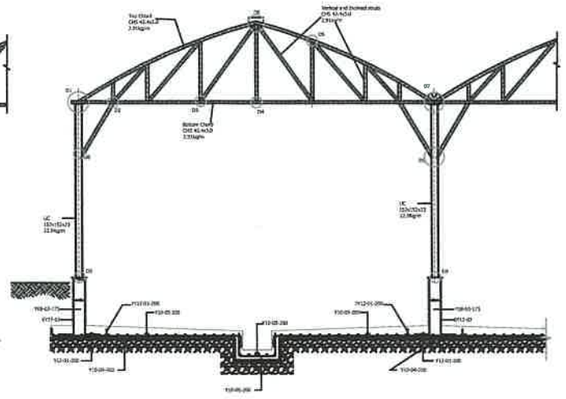

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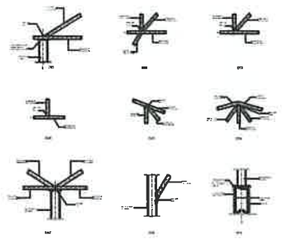

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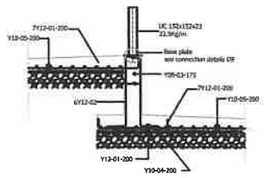

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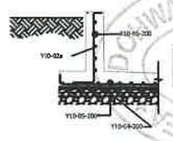


Typical wall section details

CLIENT

UNITED REPUBLIC OF TANZANIA

DAWASA
P.O.BOX 1573, DAR ES SALAAM

CONSULTANT

DOHWA

DOHWA Engineering Co., LTD,
P0 Box 9838,
Plot No. 418, Ocean Drive Residence, A2A,
Oyster bay, DSM, Tanzania

CONTRACTOR

SHANXI CONSTRUCTION ENGINEERING CORPORATION AND MINERAL COMPANY
Plot No.109 Ali Bin Said Road, Oysterbay
DAR ES SALAAM, TANZANIA
P.O.Box 106293 DAR ES SALAAM
MOBILE: +255787674370
Email: [illegible]

PROJECT TITLE

CONSTRUCTION OF FAECAL SLUDGE TREATMENT PLANT (FSTP) AT MITAMBA SITE, KIBAHA-PWANI REGION

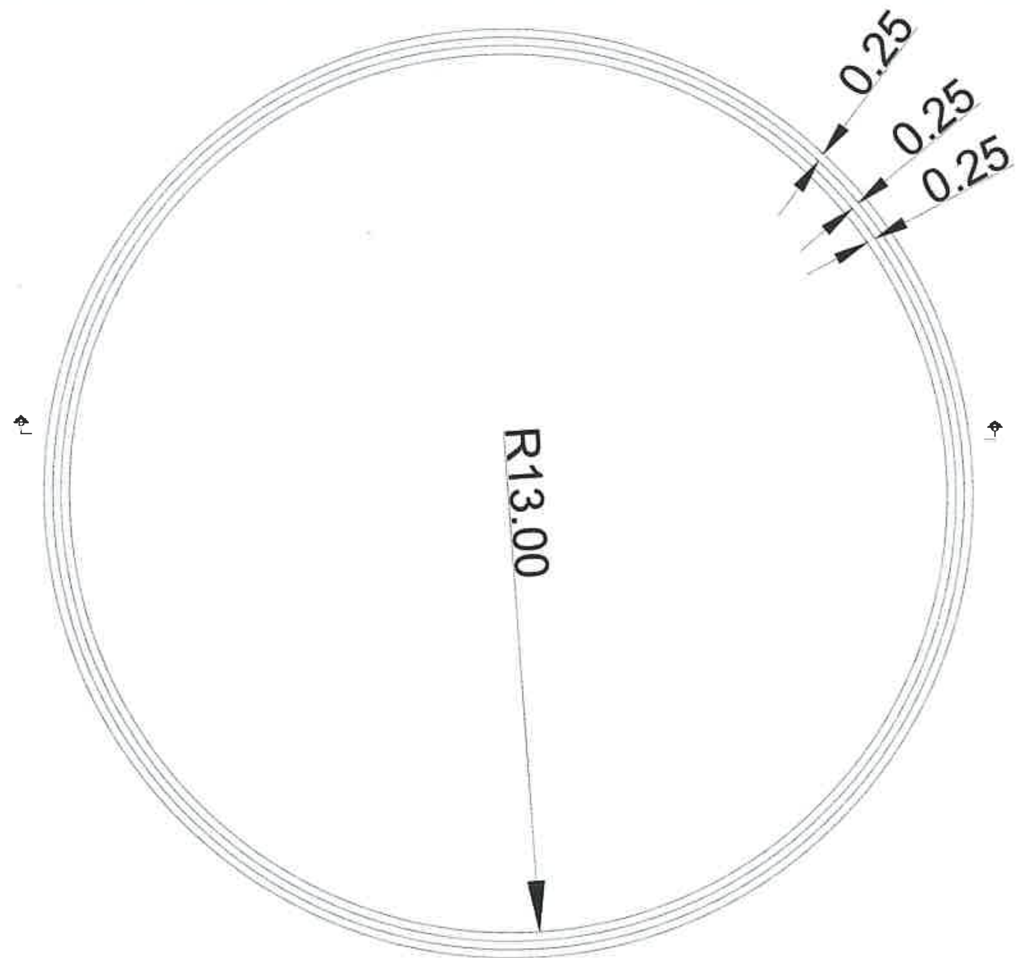
DRAWING TITLE

FSTP (220m³ size) MITAMBA KIBAHA, UNPLANTED DRYING BEDS - PLAN AND SECTIONS

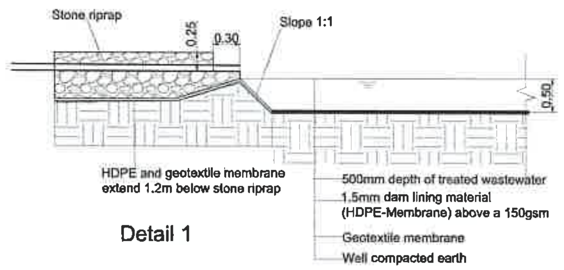
DRAWING NO.

SCEMC - FSTP - KIBAHA - FSTP- 008

SCALE:	REV02	DESIGN BY:	DRAWN BY: SHANXI
AS SHOW	DATE: 01/05/2025	CHECKED BY:	APPR. BY:



POLISHING POND - PLAN VIEW



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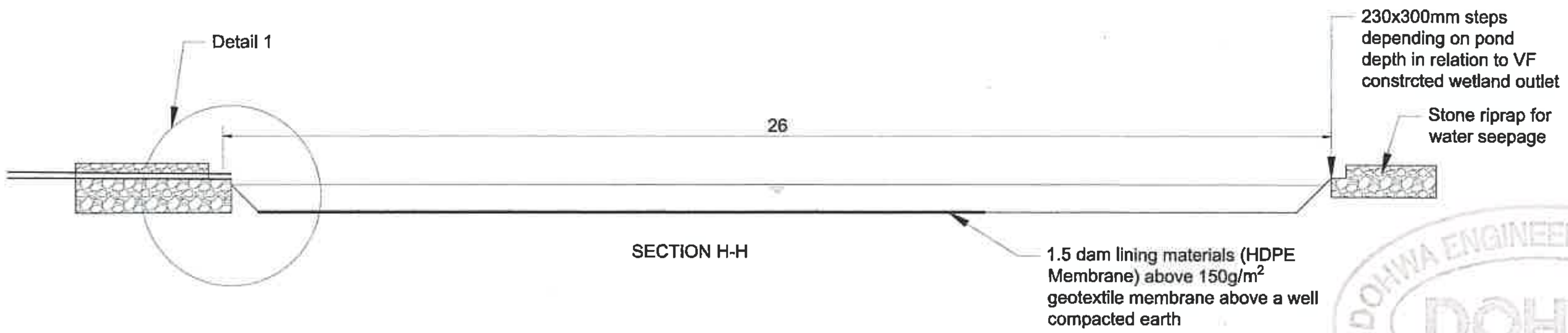


SECTION H-H

CLIENT

UNITED REPUBLIC OF TANZANIA

DAWASA

P.O.BOX 1573, DAR ES SALAAM

CONSULTANT

DOHWA

DOHWA Engineering Co., LTD,
PO Box 9838,
Plot No. 418, Ocean Drive Residence, A2A,
Oyster bay, DSM, Tanzania

CONTRACTOR

SHANXI CONSTRUCTION ENGINEERING CORPORATION AND MINERAL COMPANY
Plot No.109 Ali Bin Said Road, Oysterbay
DAR ES SALAAM, TANZANIA
P.O.Box 106293 DAR ES SALAAM
MOBILE: +255787628370
Email: [illegible]

PROJECT TITLE

CONSTRUCTION OF FAECAL SLUDGE TREATMENT PLANT (FSTP) AT MITAMBA SITE, KIBAHA-PWANI REGION

DRAWING TITLE

FSTP (220m^3 size) MITAMBA KIBAHA, POLISHING POND - SECTIONS AND DETAILS

DRAWING NO.

SCEMC - FSTP - KIBAHA - FSTP-015

SCALE: AS SHOW	REV02	DESIGN BY:	DRAWN BY: SHANXI
	DATE: 17/02/2025	CHECKED BY:	APPR. BY:

APPENDIX III: STAKEHOLDERS CONSULTATION MINUTES

HALMASHAURI YA MANISPAA KIBAHA.

MUHTASARI WA MKUTANO WA WANANCHI WA MTAA LUMUMBA ULIOFANYIKA SHULENI TAREHE 17/07/2025

AGENDA
1. Kufungua Mkutano.
2. Utambulisho.
3. Kutambulisha Mradi.
4. Kufunga Mkutano.

HALMASHAURI YA MJI KIBAHA
S.L.P. 30112
KIBAHA
TAR 17/7/2025
AFISA MTENDAJI MTAA LUMUMBA

1. KUFUNGUA MKUTANO
Mwenyekiti alifungua Mkutano mnamo saa 07:00 mchana kwa kuwakaribisha Wananchi na Wageni kutoka Dawasa.

2. UTAMBULISHO.
Mwenyekiti aliwakaribisha wageni kutoka Dawasa wajitambulishe. Viongozi/Wageni wa Dawasa walijitambulisha mmoja mmoja kuna waliotoka Makao Makuu na Mkoa wa Kibaha Dawasa waliongozwa na Meneja wa Mkoa.

3. KUTAMBULISHA MRADI.
Mwenyekiti alimkaribisha Injinia wa Dawasa aweze kutoa maelezo kuhusu Mradi. Injinia alieleza kuwa Mradi huu ni wa Usafi wa Mazingira na jina la Mradi ni "Ujenzi wa Mtambo wa Kuchakata Majitaka wa Kisasa. Mradi huu unaweza kuchakata Lita 220,000 kwa siku na gharama za Mradi ni BIL. 3.8 za Kitanzania. Aliongeza kuwa Mradi huu una faida kubwa kwa jamii kama
- Kupunguza gharama za huduma za Majitaka
- Kuboresha Usafi wa Mazingira
- Kupunguza Umbali wa huduma ya Majitaka
- Vijana wa Lumumba kupata Ajira za Vibarua wakati mradi unatekelezwa.

Baada ya maelezo hayo Injinia aliwasilisha, Meneja wa Dawasa Mkoa wa Pwani alieleza Mradi wa Maji safi kuwa Mradi Umeshaanza na Ughamu kwa Kiasi cha Tsh BIL. 8.9, Mkandarasi yupo site na Ujenzi umeshaanza na Utakuwa na awamu tatu. Meneja alikaribisha Maswali au Maoni. Wananchi waliuliza unaanza lini na wapi. Meneja alieleza kwa kufafanua kuwa Mradi umeshaanza na unajengwa eneo la Mtaa wa Pangani. Wananchi pia waliuliza eneo la Mradi ni lipi na athari kwa binadamu. Injinia alieleza Mradi utajengwa eneo la Mtambo na akamkaribisha Mwananchi anayefahamu vizuri huu mradi, Mwananchi mmoja alijitolea na kutoa uzoefu wake kuwa

anaufahamu vizuri mradi wa Vingunguti Mabwawa yake ni ya Wazi. Lakini huu wa kwetu ni unafunikwa kote hivyo mradi huu kama Mwananchi Mwenzenu awahakikishia hauna athari zozote kimazingira. Mwandisi Mshauri aliongeza kuwa kabla mradi huu ulikuwa na faida za ajira kwa vijana wa eneo hili na Wamama kufanya biashara ndogondogo wakati wa ujenzi. Hivyo aliwauliza wananchi kama wanaupokea mradi au hawaupokei. Wananchi kwa pamoja walijibu kuwa wameupokea. Dawasa walieleza kuwa eneo la mradi ni Ekari 10 ambapo Ekari 6 itajengwa mtambo na Ekari 4 ni za shamba darasa (Kibaru cha miche). Afisa - Maendeleo ya Jamii Dawasa alieleza Uundaji wa Kamati ya ya Kushughulikia Malalamiko. Kwa Mujibu wa Muundo wa Kamati ngazi ya Mtaa ni Ufuatao:-

i) Mwenyekiti wa Mtaa - Mkiti wa Kamati
ii) Afisa Mtendaji Mtaa - Katibu wa Kamati
iii) Afisa Maendeleo wa Kata - Mjumbe
iv) Mwakilishi wa Wananchi - Mjumbe
v) Mwakilishi wa NGO's - Mjumbe.

Hivyo sasa hivi tunatakiwa kumteuwa au kumchagua Mjongo ni Mwenyu Mwakilishi Mmoja na Mwakilishi Mmoja wa NGO's Wananchi walipendekeza wajumbe wa Kamati kama ifuatavyo:-

1. Amos Masamba - Mkiti - 0753-847653
2. Paul Kyara - Katibu - 0783-934045
3. Rose L. Ngalai - Mjumbe - 0716-005343
4. Justha S. Philiph - Mjumbe - 0782-930361
5. Mch. Daniel Makalla - Mjumbe - 0693-053045

Baada ya maelezo hayo na kukamilika kwa kuundwa kwa Kamati ya Kushughulikia Malalamiko Mwenyekiti alifunga agenda hii.

4. KUFUNGA MKUTANO

Mwenyekiti alifunga Mkutano Mnamo Saa 08:53 mchana kwa kuwashukuru wananchi na Wataalam wa Dawasa.

[signature]   [stamp: HALMASHAURI YA MJI KIBAHA, S.L.P. 30112 KIBAHA, TAR. 17/7/2025, AFISA MTENDAJI MTAA ...]   [signature] Kyara.

MWENYEKITI   KYARA, P. M.
AFISA MTENDAJI

HALMASHAURI YA MANISPAA KIBAHA

MUHTASARI WA KIKAO CHA KAMATI YA MTAA WA LUMUMBA NA DAWASA KILICHOFANYIKA 16/07/2025

MAHUDHURIO

S/N	JINA KAMILI	CHEO	SIMU	SAINI
1.	Amos MASAMBA	M/KITI	0753-847653	Ammos.
2.	PAUL M. KYARA	MTENDAJI	0783-934045	[illegible]
3	RAMADHANI MRISHO NGONGO	MSUMBE	0755-018988	[illegible]
4	FLORA JOSEPH URASSA	MJUMBE	0686-461367.	[illegible]
5.	JANETH ALBARD SHIRIMA	MJUMBE	0715-475998	[illegible]
6.	YOHANA SAMSONI KAJORO	MJUMBE	0693016166	[illegible]
7	MELKIZEDECK STEPHANO	Env. Consultant	0756075875	[illegible]
8.	Musse Kidwangise	Dawasa (Cdo)	0716161826	[illegible]
9	Frederick Muyungu	Dawasa (Eng)	0743 222758	[illegible]
10	Irene lanta Leo	DAWASA (Eng)	0653968363	[illegible]
11	STELLA KUNDY	DAWASA (CDO	0752817766	[illegible]
12.				

AGENDA

1. Kufungua Kikao
2. Utambulisho
3. Kutambulisha Mradi
4. Kufunga Kikao.

HALMASHAURI YA MTAA KIBAHA S.L.P. 30112 KIBAHA TAR: 16/7/2025 AFISA MTENDAJI WA MTAA LUMUMBA

1. KUFUNGUA KIKAO

Mwenyekiti alifungua Kikao Mnamo Saa 10:09 Asubuhi Kwa Kuwakaribisha Wageni.

2. UTAMBULISHO.

Mwenyekiti aliongoza Utambulisho Kwa Kuanza na Viongozi wa Mtaa na Kumalizia Kwa Wageni Kutoka Dawasa.

3. KUTAMBULISHA MRADI

Mwenyekiti aliwakaribisha wageni - Kutoka Dawasa waweze kueleza yale waliyokuja nayo. Afisa Maendeleo ya Jamii wa Dawasa alianza kwa kutoa maelezo kidogo kuhusu mradi na ~~Mambo~~ namna ya kuunda kamati ya malalamiko. Baada ya maelezo hayo alimkaribisha Injinia aweze kutoa maelezo ya kina juu ya mradi.

Injinia alieleza kuwa Serikali imepata fedha ya miradi mbalimbali ya Maendeleo kutoka Benki ya Dunia. Kati ka fedha hizo Dawasa ilipata kiasi cha Tsh Bil. 16.6 kutoka Wizara ya fedha kwa ajili ya Mradi wa Ujenzi wa Mbamba wa kuchakata Maji taka wa Kisasa. Aliendelea kueleza kuwa gharama halisi za Ujenzi ni Bil. 3.8. Mradi huu unafaida nyingi kama:-

- Kuboresha Usafi wa Mazingira
- Kupunguza Umbali wa huduma
- Kupunguza gharama kwa watumiaji (Wateja)
- Uwezo wa huu mradi ni kuchakata Lita 220,000 kwa siku

Baada ya maelezo hayo na kuwapitisha wajumbe kwenye mchoro na kueleza hatua za kuchakata majitaka alikaribisha maswali au maoni.

Wajumbe waliuliza maswali yafuatayo:-

i) Vijana au Wananchi wa Lumumba watanufaika na nini kwenye huu mradi

ii) Mbali na mabumbu kwenye mimea ni mabumbu gani ya maji kibinadamu.

iii) Uharibifu wa mazingira upoje kwa wale wanao zunguka eneo la mradi.

Injinia na Mshauri walijibu na kutoa ufafanuzi maswali na baadhi ya maoni kutoka kwa - wajumbe kuwa:-

Vijana na Wananchi wa eneo hili Watanufaika Kwa ajili ya Kipindi cha Ujenzi wa Mradi na Ufanyaji biashara ndogondogo wakati Ujenzi unaendelea. Pia wananchi watanufaika kwa gharama nafuu za huduma ya Maji baada ya Mradi Kukamilika.

- Maji yatatumika kwa Mimea bu Hasi kwa Matumizi ya Kibinadamu.
- Umeshafanyika utathimini ya kimazingira na hakuna athari yoyote ya Mazingira kwa Majirani

Baada ya Ufafanuzi huo Afisa Maendeleo ya Jamii. alielezea kuwa Dawasa Kabika Miradi Kama hii ina muongozo wa Kushughulikia Malalamiko Kwa Kuunda Kamati za Malalamiko. Kwa ngazi ya Mtaa wajumbe ni Mwenyekiti wa Mtaa, Afisa Mtendaji wa Mtaa, Afisa Maendeleo wa Kata, Mwakilishi mmoja wa Wananchi na Mwakilishi mmoja Kutoka taasisi isiyo ya Kiserikali. Jumla watu 5. na itapatiwa Mafunzo. Pia ilihitajika Viongozi wa Mtaa washauri ni Mfumo gani mzuri utumike wa Kuajiri Vijana. Ilipendekezwa na Kuazimiwa Kwa Mkandarasi alete barua ya Kuomba Vibarua na barua hiyo ionashe Idadi ya Vibarua na Sifa za Kila Kundi.

4. KUFUNGA KIKAO

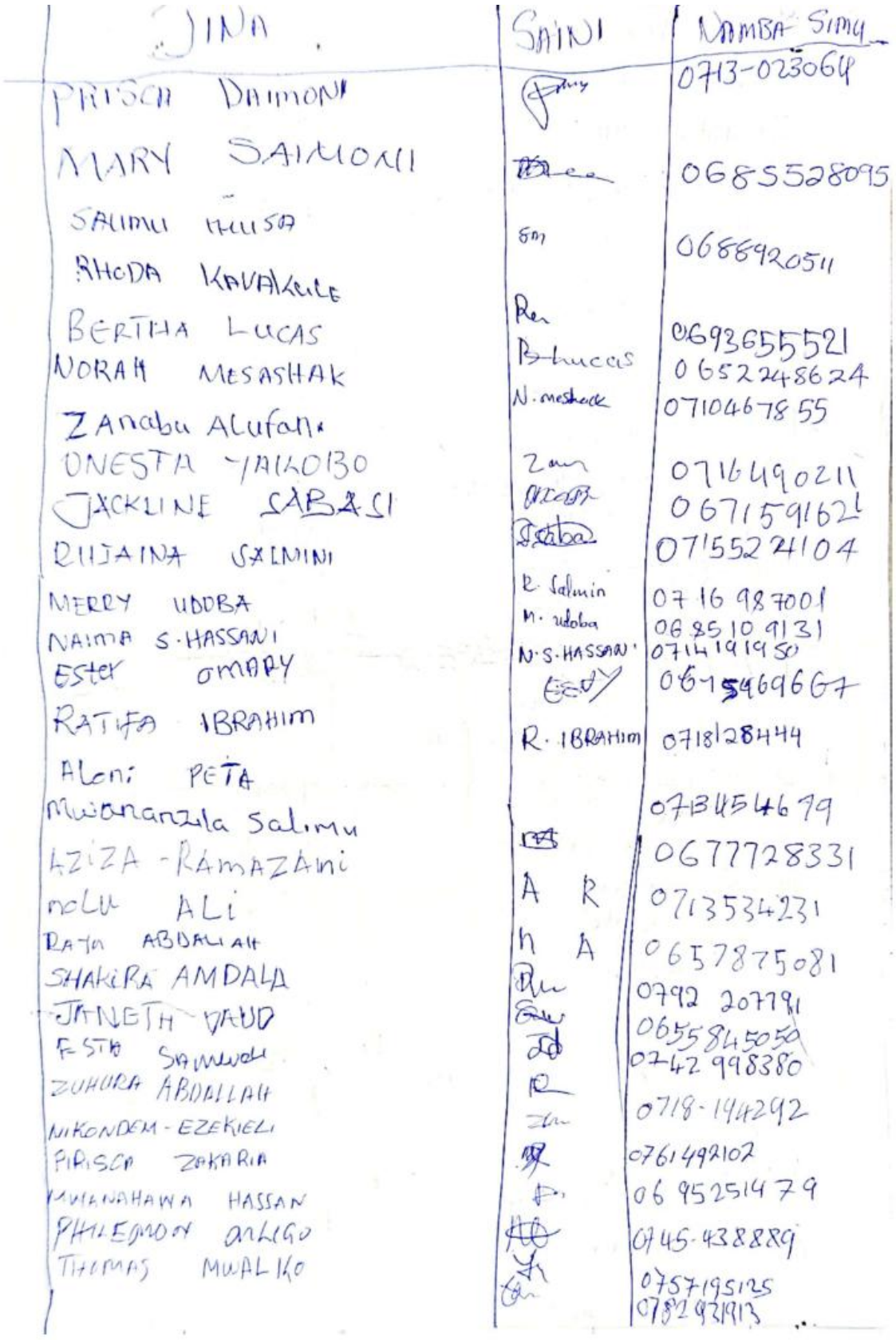
Mwenyekiti alifunga Kikao Mnamo Saa 11:35 jioni Kwa Kuwashukuru Dawasa na Wajumbe.

[signature] MWENYEKITI

[stamp: S.L.P. 30112 KIBAHA] [signature] KYARA, P. M. AFISA MTENDAJI

MAHUDHURIO YA MKUTANO WA WANANCHI WA [illegible] KUHUSU MRADI WA UJENGI WA UKUTA WA MADARASA.

	JINA LA MWANANCHI		SAHIHI
1	NEEMA	CHUNGU	
2	LEVINA	DAUDI	LD
3	ESTA	CHAKI	
4	UPENDO	KIONDO	
5	MARY	MANGI	
6	DIANA	RAMADHANI	
7	LEAH	YOHANA	
8	SALUNA	LYAMASHI	
9	FLORA	ANDREW	F.A
10	Juliya	Suleyman	
11	PRUSENSIA	ROCK.	P. Rock
12	SARAFINA	MUSHI	S.
13	TAUSI	ABDUL	
14	HAWA	J. PERENJE	T.A.
15	KARIM	RAMADHANI	
16	FAIDHAT	SAID	
17	RICHARD	DAUDI	
18	[illegible]	KASSIMU	
19	FATMA	MWAJALIWA	
20	MAGRETH	JOHN MKAMAI	
21	ZINABU	ALEL MABWI ADRUS	ZAN
22	SANIA		
23	SHAMIFA	KASSIM	
24	AMINA	ALLY	A.A
25	MWANDAIB	RASHID	M.R
26	TATU	BEYTUL	



JINA	SAINI	NAMBA SIMU
PRISCA DAIMONI		0713-023064
MARY SAIMONI		0685528095
SALIMU HUSSA		0688920511
RHODA KAVALELE		
BERTHA LUCAS		0693655521
NORAH MESASHAK		0652248624
ZAnabu ALufani		0710467855
ONESTA MALOBO		0716490211
JACKLINE SABASI		0671591621
RUJAINA SALMINI		0715524104
MERRY UDOBA		0716987001
NAIMA S.HASSANI		0685109131
Ester OMARY		0714191950
RATIFA IBRAHIM		0671546967
Aleni PETA		0718128444
Mwanamzila Salimu		0734546479
AZIZA - RAMAZANI		0677728331
nOLU ALI		0713534231
RAYA ABDALLAH		0657875081
SHAKIRA AMDALA		0792 207791
JANETH DAUD		0655845050
FESTO SAMWELI		0742 998380
ZUHURA ABDALLAH		0718-144292
NIKONDEM - EZEKIELI		0761492102
PRISCA ZAKARIA		0695251479
MWANAHAWA HASSAN		0745-438889
PHILEMON ANLIGO		0757195125
THOMAS MWALIKO		0782 931913

1	REHEMA MATHAYO	Rmathayo	
2	TIMA SHEIKH	F.S.	
3	REGINA NTAMBU	Rbe	
4	JUSTINA - SALUMDAY	[illegible]	
5	FILILI - HUSEIN	[illegible]	
6	HAPPY G. LUVAKO	Gluvako	
7	ASMA HABIBU	A.H	
8	MAIMUNA JEILANI	MJ	
9	BENSON JOHNSON	B.Johnson	0626-793681
10	THOMSON MANUO	[illegible]	0714729737
11	LEONARD KWEKA	[illegible]	07408850
12	CHRISTINA PANJA	Cpanja	0788143957
13	SELINA ERNEST	[illegible]	0789310049
14	SHAMILA ISSA	[illegible]	0683696197
15	Rose Leonard	B	-
16	MIRIAM GEORGE	[illegible]	0683-523708
17	TUMAINI MTOPO	[illegible]	0677837322
18	AMINA ALLY	A.ALLY	0693808810
19	CHRISTOFER MGAYA	[illegible]	0654212412
20	SHAKILA KARIM	[illegible]	0788-327815
21	HALIMA JUMAS	[illegible]	0693-717309
22	HADIJA HABIBU	H.H	0713004566
23	SARAH MORIS	Smoris	0694020161
24	GOTROSE B. Massawe	[illegible]	0673800735
25	AMINA ALLY	AA	0719451005
26	BELINA MSIGWA	Msigwa.	0712-998855
27	AZIZA A MOHAMED	[illegible]	0674113056

	JINA LA MWANANCHI	NAMBA	SAHIHI
(1)	BATULI MURAJI	0787019118	
(2)	BEATRICE Lusiani	0717027982	
3	FORTUNATUS NGEREZA	0715430006	
4	EWALD J. SAMBA	0688049510	
5	FARAJA CHINGULA	0788696465	
6	MARIA MAUMA	0711629620	
7	ANNA ROBERT	0755999681	
8	NEEMA KASSIMU	0719994544	
9	BAYA KULIMA	0719815489	
10	VICTORIA THEOBALD	0799759526	V.Frank
11	FAIDHA JAFFARI	0783239971	
12	JACKSON MWAKASEKELE	0755643353	
13	SAMIRA ZUBERI	0689-711872	
14	MARY MESHACK	0716-446406	
15	ATILIO FREDY FUNGO	0792 580-905	
16	YASINI DIMAS YASINI	0783774262	
17	CAROLINA ROBATI	0747-222670	
18	TERESIA SEVERINI	0654998033	
19	DATIVA B PONERA	0713-89780	Dorria
20	LOYCE MWAZUMBA	0747-474608	
21	THERESIA MARIK	-	march
22	Fredrick Mujunga	0743222468	
23	Musso Kidwangus	0716161826	
24	TAUSI MBOGO	0742 140 100	

MAHUDHURIO YA MKUTANO WA WANANCHI

WA LUMUMBA KUTANGAZA MRADI WA UJENZI

1	ZENA RAJABU		0675541741
2	[illegible]		0693.05.3045
3	MATHA JOSEPH		0682942419
4	SAMWEL PIMA		0767-120880
5	AMINA HATIBU	A.H.	0657692421
6	ASHA ALLY		0693422250
7	HELLEN GEORGE	H. George	0768435597
8	MARIAMU SHABANI		0782949245
9	HANIMA MDOGWA		0655-615001
10	EDITA ETADEI	E.T	0759327748
11	ASHA ADAM	A.D	0714145257
12	HIDAYA OMARY	H.O	0698154845
13	FATUMA JAFARI	F.J.	0655279912
14	HAWA J. PERENJE	PERENJE	0744-905959
15	HERIETH CHRISTIAN		0693 116 150
16	HAPPINESS JACKSON		0653942737
17	MAHAMED JUMA		0692019273
18	CATHERINE GIDION	C. Gidion	0765607861
19	CHRISTINA KIMARO	Kimaro	0763908083
20	JOSEPH PETER MWIGIRA		0712-654026
21	JOYCE PAUL MNGANYA		0699152610
22	HETIE MAMBO	H.M	0688394574
23	SUHANI HAMZA JUMA		0654-545625
24	[illegible]		0658 49 64 40
25	[illegible]		
26	MASHIDI ALY	R.H.	
27	[illegible]		

MAHUDHURIO YA VIONGOZI WALIOHUDHURIA MKUTANO
WA WANANCHI WA LUMUMBA TAREHE 17/07/2025
KUTANGAZA MRADI WA NYUMBA VINNE VYA MADARASA.

	JINA LA KIONGOZI	CHEO	SAHIHI	SIMU
1	JUMA KURUSA	AEK	[signature]	0621007000
2	INSP KIRITA	INSP	[signature]	0715524104
3	S/SGT KHALID MOHAMED	S/SGT	[signature]	0690181[illegible]
4	EMANUEL MALILA	Mtendaji [illegible]	[signature]	0683171824
5	AMOS MASAMBA	M/KITI MTAA	[signature]	0753-84769
6	MWANTORO J. MSHUTI	MWL. MKUU	[signature]	0714228610
7	ZAWADI S CHILAMBO	M/MSAIDIZI	[signature]	0689103440
8	MAIMUNA TAMIMU KATIMBA	MJUMBE	[signature]	068446949
9	SOFIA ALLY MSAIDI	WAZEE/MJUMBE	[signature]	0618308373
10	CHRISDINE BIYENGO	MZEE	[signature] KATIBU	0713837622
11	LAZARO SILLA	-"-		[signature]
12	NURU MJAIDI	-"-		
13	MARYNDA AUSI	-"-		
14	ALLY RASHIDI			
15	ISSA-K. RAJABU	mwl	[signature]	0763002667.
16	JANETH A. SHIRIMA	S/MTAA MJUMBE	[signature]	0715-475995
17	IRENE LANTA LEO	DAWASA	[signature]	0653968363
18	STELLA KUNDY	DAWASA	[signature]	0752817[illegible]
19	Melkzedek Stephen	Royal-ASS	[signature]	0755097887

JINA	SAINI	
JASMINE SILINGWE	Bilungwe	
Fortunata Urio	Urio	
MOHAMED J. ZAHORO	[illegible]	
ANIPHA MDINDILE	A. mdindile	
AVINIWE MADEMBWE	A. madembwe	
MARIAMU KHALFAN	Mu	
FLORA HYUMI	Faya	
LUSI MSIGWA	L. [illegible]	
MARIA Mgani	Mgani	
FATMA Ally MWADUGA	Ally	
ZULEKHA RASHID	Rashid	
ALAFA MOHAMED	A Mohamed	
JACKLNE TARIMO	[illegible]	
MWANAISH HASAN	M.H.	
Simon J. MAYOBA	Smyoba	0684532121
FADHILWA KH. SALUMU	Salu	
HIDAYA O KUMBALA	H. K	0688322849
PELIDA YISILU	R.YISILU	
CATHERINE NGASA	Ngasa	0688-480679
SAFIA TWAHA SINGO	Sa.	0793822324
JACLINE ZUBERI	J. zuberi	0614132130
MAGDALENA Paulo	[illegible]	0683938573
RADHIA GUNGA		
TATU MLENGE	BDALLAH	0782903168
RUNA TARIMO	Rubo	065929 2679
AMINA JUMA	Juma	0682643858
JOCY STEFANO		
REHEMA RAMAJ		0688661878
MWANAHSITTI KHAMISI	R.R	0789841199
AZIZA TWALIBU MUSA	M. Khamisi	0689-549544
	Aziza	0718-702713
MWANAHOMBO MBWANA	M.Mb	0787-222281

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY:

MAONI YA WADAU KWA AJILI YA UANZISHWAJI WA MRADI WA MTAMBO WA UKIUSANYAJI NA UCHAKATAJI WA MAJI TAKA UTAKAOJENGWA KATIKA MTAA WA LUMUMBA, KATA YA PANGANI, HALMSHAURI YA MJI WA KIBAHA MKOA WA PWANI

S/N	DATE/ TAREHE	NAME/ JINA	INSTITUTION/ TAASISI	POSITION/ CHEO	PHONE NO./ SIMU	SIGNATURE/ SAHIHI
1	24.10.2025	RAHEL ULAYA	KMC	EMO	0757760161	
2.	24.10.2025	OMARI H. KAMANGU	KIBAHA MC	[illegible]	0713236991	
3.	24/10/2025	BENJAMIN HUMPHREY MPITTU	PANGANI WARD	WEO	0712133445	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY:

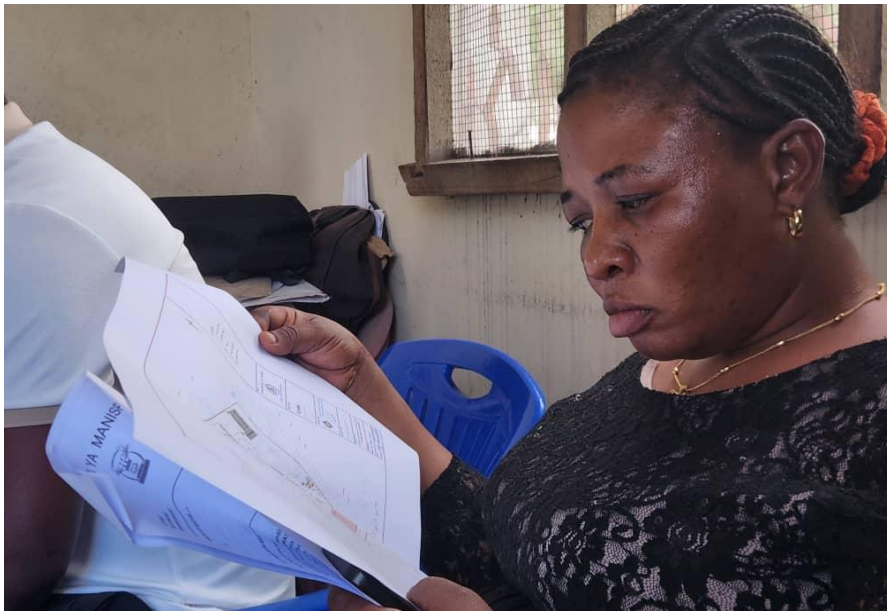
MAONI YA WADAU KWA AJILI YA UANZISHWAJI WA MRADI WA MTAMBO WA UKIUSANYAJI NA UCHAKATAJI WA MAJI TAKA UTAKAOJENGWA KATIKA ENEO LA MITAMBA MTAA WA LUMUMBA, KATA YA PANGANI, HALMSHAURI YA MANISPAA YA KIBAHA MKOA WA PWANI

S/N	DATE/ TAREHE	NAME/ JINA	INSTITUTION/ TAASISI	POSITION/ CHEO	PHONE NO./ SIMU	SIGNATURE/ SAHIHI
01.	19/02/2026	Evamary Frimini	KIBAHA - MANISPAA	TPO	0767 660550	

- Matumizi yaliyopangwa katika eneo yanaendana na mradi unaotarajiwa kuwekwa. Hii ni kwa mujibu wa Mchoro wa Mipangemiji.
- Taratibu za kupata Hati miliki ya eneo Zikamilike.

TOWN PLANNER
KIBAHA MUNICIPAL COUNCIL
P.O. Box 30112, PWANI

Stakeholders meeting at Lumumba



THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

Dar es Salaam Water supply & Sanitation Authority

DAWASA Building, Dunga/Malaga Street,
Mwananyamala Area
P. O. Box 1573, Dar es Salaam. TANZANIA.
Tel. +25522276006/15; Fax: +255222762480;
E-mail: dawasaceo@dawasa.co.tz

NON-TECHNICAL SUMMARY

DETAILED PROJECT BRIEF FOR THE PROPOSED CONSTRUCTION OF FEACAL SLUDGE TREATMENT PLANT TO BE CONSTRUCTED AT MITAMBA AREA, LUMUMBA MTAA, PANGANI WARD KIBAHA MUNICIPAL COUNCIL, PWANI REGION

Lead Consultant:
Prof. Rubhera RAM Mato (PhD), CEng. (T), Reg. EIA Expert
Mobile: +255754898592; E-Mail: rubheramato@gmail.com

Submitted: March, 2026

EXECUTIVE SUMMARY

Proponent: DAWASA

Proponent's Contact: DAWASA House, **Dunga/Malanga**
Street/Mwananyamala
P.O Box 1573 DSM
Tel: +255222760006/15
Fax: +255222762480
Email Address: info@dawasa.go.tz

EIA Expert: **Prof. Rubhera RAM Mato**
(PhD), CEng. (T), Reg. EIA Expert
Mobile: +255754898592
E-Mail: rubheramato@gmail.com

Executive Summary

Background

The Government of the United Republic of Tanzania (GoT) through the Dar es Salaam Water and Sewerage Authority (DAWASA) under the Ministry of Water intends to implement an Off Grid Sanitation Project (OGSP) to serve peri-urban areas not connected to the central sewerage system. DAWASA has received financing from the International Development Association (IDA) in the form of a credit to implement the project. Prior to implementing the project, the law in Tanzania requires an Environmental Impact Assessment to be conducted and approved by relevant authority. In order to comply with the law in Tanzania, the DAWASA intends to apply a portion of the proceeds of the credit to eligible payments for consulting services for Preparation of Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) Report for construction of off grid sanitation projects.

Kibaha, located in Pwani Region of Tanzania, has experienced significant transformation over the past two decades. Formerly a modest township with scattered rural characteristics, Kibaha has evolved rapidly, both demographically and economically, owing largely to its strategic proximity to Dar es Salaam, the country's largest commercial city. Situated approximately 40 kilometers west of Dar es Salaam along the major Morogoro Highway, Kibaha has increasingly become a residential, commercial, and in In response to the persistent environmental and public health challenges arising from inadequate sanitation in urban and peri-urban areas, the Government of Tanzania, through the Ministry of Water and in collaboration with the Dar es Salaam Water and Sewerage Authority (DAWASA), is implementing the Off-grid Sanitation Project. This initiative is financed by the World Bank and aims to provide

improved sanitation infrastructure to underserved communities that are not connected to the central sewerage network. The proposed Off-grid Sanitation Project in Kibaha Municipal is the construction of a Fecal Sludge Treatment Plant (FSTP) in Mitamba area, Lumumba Mtaa, Pangani Ward within Kibaha Town Council. The facility will serve as a critical intervention to:

- Improve urban sanitation services through safe collection, transport, treatment, and disposal of fecal sludge.
- Prevent environmental contamination.
- Support the sustainable urban development of Kibaha as it aligns with national development frameworks and the World Bank's safeguard standards.

The EIA is prepared in line with World Bank Safeguard Policies requirements, Tanzanian Environmental Management Act (2004), and other relevant legal instruments. The document outlines mitigation, monitoring, and institutional arrangements for managing potential impacts.

Nature of the Project

The proposed project concerns construction of Faecal Sludge Treatment Plant FSTP for public use at Mitamba area, Lumumba Mtaa, Pangani ward, Kibaha Municipality. The nature of the project enhances environmental protection through proper handling and disposal of domestic sewage. According to First Schedule of the EIA and Audit Regulations (Amended) of 2018, the nature of the project entails no significant impacts. The project falls under Type B2 category, which according to the regulations are "medium-scale activities and enterprises that require registration but shall not require Environmental Impact Assessment. Further, the projects shall not require screening and scoping, rather, the Project Brief shall be examined and issued with an Environmental Impact Assessment Certificate.

Scope of the ESMP

This Environmental and Social Impact Assessment (ESIA) for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba area, Lumumba Mtaa, Pangani Ward, Kibaha defines clear temporal, spatial, and institutional boundaries to guide the assessment of potential impacts. Spatially, the study covers the entire project footprint, including treatment units, access roads, drainage systems, and ancillary facilities, as well as adjacent areas that may be directly or indirectly affected by construction activities, traffic movements, odour emissions, noise, dust, and surface runoff.

PROJECT DESCRIPTION

Project Location and Justification for Site Selection

The proposed Fecal Sludge Treatment Plant (FSTP) will be located at Mitamba area, within Lumumba Mtaa, in Pangani Ward, which is part of Kibaha Municipal Council, in the Pwani Region of the United Republic of Tanzania approximately 13.7kilometers from the Kibaha Town center. The selected site lies on the outskirts of Kibaha town and

is strategically positioned to serve urban and peri-urban settlements within the municipality. The area is accessible via existing local access roads that connect to the main highway (Morogoro Road – A7), which facilitates the movement of fecal sludge transportation trucks and construction materials. The site is situated in a semi-urban environment characterized by scattered residential housing, open spaces, and low-density development.

Accessibility

The proposed FSTP project site is, approximately 13.7 km from Kibaha Town center and accessible via the Morogoro highway. From the main highway, access to the site is through a local feeder road that connects the settlement to the main road network.

Currently, the access road to the project site is a murram (earth) road, which is passable during dry seasons but may require improvement during the rainy season to allow smooth transportation of construction materials, desludging trucks, and maintenance vehicles. Temporary upgrading, such as graveling or grading, is recommended during the construction phase to ensure uninterrupted site access.

Land Ownership

The land allocated for the FSTP project and/or any centralized collection infrastructure has been officially allocated to DAWASA by the Kibaha Municipal Council. A formal allocation letter has been issued and attached as Appendix i, confirming that the area is public land under the jurisdiction of the Municipal Council, and is exempt from encumbrances or private claims. This provision ensures smooth project implementation immediately related to land tenure conflicts.

Project Design

The proposed technology and construction design follows the objective to execute an engineering design of fecal sludge management facility (one in number at the stated site) which will be simple, cost effective/efficient, easy to operate and maintain performance standards which conform to NEMC. The proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba in Kibaha Town Council has been designed with an operational lifespan of twenty (20) years, taking into account projected population growth, increasing fecal sludge generation rates, urban expansion, and anticipated climate variability within the service area.

Process Description and project Components

The main treatment technologies that are adopted in the design of FSTP are based on solid-liquid separation, stabilization, dewatering of sludge and pathogen removal. The separated liquid component is also treated to meet discharge standards. The faecal sludge from different parts of the city will be conveyed to the FSTP through manual or automated desludging trucks. The treatment modules for solid components are: Feeding (receiving) Tank (FT) with screen chamber, Settling-Thickening Tank (ST), Anaerobic Stabilization Reactor (ASR), Unplanted Drying Bed (UPDB). Treatment modules for liquid components are: Anaerobic Baffled Reactor (ABR), Settler, Constructed Wetland (CW) and Polishing pond. The treated water from the polishing pond will also be re-used for cleaning of the FSTP facilities.

Project phases and Activities

The proposed project entails the construction and operation of a decentralized Fecal Sludge Treatment Plant (FSTP) that will safely manage sludge collected from pit latrines and septic tanks within Kibaha Town and its surrounding areas. The plant will be designed to handle an estimated capacity of 220m^3 of sludge per day, more details are presented in Chapter 2 of detailed Project brief.

Utilities

Wastewater Generation: Wastewater generation was estimated basing on the per capita consumption of water supply of which 85% percent is converted into wastewater. However considering the design specifications of the proposed FSTP the amount of wastewater that will be generated after the whole process is estimated to be 75,746m^3/Year (Design report, 2025). The treated wastewater will be discharge in the nearby stream.

Labour: The proposed Fecal Sludge Treatment Plant (FSTP) project will employ different categories of manpower during its phases. During the construction phase, the project is expected to employ approximately 40–50 workers, including skilled, semi-skilled, and unskilled labour.

Electricity: The main source of electricity is from TANESCO and the estimated power consumption per month is about 1,000 units. However, there is a standby generator with 30KVA as an alternative source of power during power cut off.

POLICIES, LEGISLATION AND INSTITUTIONAL ASPECT

INTRODUCTION

According to the fundamental principles of environment, any developmental activities of this nature such as construction of Faecal Sludge Treatment Plant would have socio-economic and somehow environmental impacts that must be addressed and governed in order to serve public interest and sustainable development. Given the many existing and developing environmental laws, regulations and standards in Tanzania, it is worth considering resorting to constitutional provisions to protect and manage the environment. With increasing environmental awareness in recent decades, the environment has become a higher political priority and many constitutions now expressly guarantee a ‘right to a healthy environment’, as well as the procedural rights necessary to implement and enforce the substantive rights granted. The public or national interest in this aspect is addressed through government Policies and regulated by Principal Acts and Regulations. The implementation of the proposed project shall touch various sectors; therefore, the developer has to comply with number of cross-sectorial policies and legislations relevant to this project. Also, the listed institutions involved in environmental management for the project is included in this chapter.

Relevant Policies

- National Environment Policy 2021

- National Land Policy of 1997
- Construction Industry Policy (2003)
- National Health Policy (2003)
- National Gender Policy of 2000
- National Human Settlements Development Policy (2000)

Principal Legislations and Regulations

- Environmental Management Act (2004)
- The Environmental Management (Fees and Charges) Regulations, 2021
- The Environmental Management (Control of hazardous Waste) regulations, 2021
- The Environmental Management (Control of Noise and vibration) regulations, 2015
- The Environmental Management (Prohibition of Plastic Carrier bags) regulations, 2019
- The Environmental Management (Solid Waste Management) regulations, 2007
- Occupational Health and Safety Act 2003
- Water Supply and Sanitation Act No. 5 of 2019 12
- Engineers Registration Act and its Amendments 1997 and 2007
- Public Health Act (2009)
- World Bank Environmental and Social Safeguards
- Institutional Framework

BASELINE INFORMATION

Introduction

This section provides baseline data on the relevant environmental characteristics of the project area in Kibaha Municipal Council, Coast Region. The description focuses on site-specific conditions relevant to the proposed Faecal Sludge Treatment Plant (FSTP), as well as broader environmental and socio-economic factors covering the wider Kibaha Municipality.

Data was obtained from primary field surveys, physical observation, and secondary sources, including the Kibaha Socio-Economic Profile (2019), Tanzania Meteorological Authority (TMA) data, and other literature on the Coast Region.

Kibaha's location along the Dar es Salaam-Morogoro highway and its proximity to Dar es Salaam City have made it one of the fastest-growing urban areas in Tanzania, attracting residential, commercial, and institutional development. The rapid population growth and increased waste generation have made improved sanitation infrastructure such as the proposed FSTP a critical necessity.

Air Quality

Ambient air quality in the proposed project area is generally good, as the location is away from heavy industrial zones. However, dust may be generated during the construction phase and from unpaved roads nearby. The parameters monitored included particulate matter ($PM_{2.5}$ and PM_{10}), oxygen (O_2), carbon monoxide (CO),

hydrogen sulfide (H_2S), carbon dioxide (CO_2), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2). The measurements were compared against the requirements of TZS 845:2019.

Noise and Vibration

The noise and vibration levels at the project site are rated negligible as the only source of noise at the project site are motor vehicles using the street feeder road adjacent to the project area.

Environmental noise levels at the Mitamba site were measured using an Integrating Averaging Sound Level Meter (Model Piccolo II, Class 2) in accordance with ISO standards. Measurements were conducted during daytime hours at five representative locations (P1–P5) around the proposed facility boundary and nearby sensitive receptors.

STAKEHOLDERS ENGAGEMENT

Introduction

Stakeholder engagement refers to a broad, inclusive, and continuous process to engage persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholder engagement enhances the effectiveness, efficacy, and accountability of the ESIA process and the project. When undertaken in a transparent, balanced manner, it can reduce conflicts and strengthen the sense of ownership of a project and the project's sustainability.

Stakeholder engagement often collaboratively identifies issues and options and helps make decisions based on input received via the stakeholder engagement process. Stakeholder engagement is a crucial part of the Environmental and Social Management Plan (ESMP) to ensure transparency, social acceptability, and community ownership of the FSTP Project in Mitamba area, Lumumba Mtaa. The engagement process follows World Bank Safeguard policy and national guidelines on public participation. Stakeholder's engagement was conducted twice (Internal meeting with local government authority and Public meeting) on 16th July and 17th July 2025, whereby the local leaders summoned a public Baraza and community was informed about the proposed project and their views were recorded as well as attendance which were attached in this report as appendix iii.

Objectives of Stakeholder Engagement

- To identify and involve stakeholders affected or likely to be affected by the project
- To collect concerns, feedback, and expectations from stakeholders
- To inform stakeholders about project scope, impacts, and mitigation measures
- To ensure stakeholder views are integrated into project design and implementation

Methods of Engagement

- Local leaders (Mtaa Leaders) internal meeting held in Lumumba Mtaa Office prior to public meeting/Baraza
- Public Consultative Meetings held at Lumumba Primary School
- Key Informant Interviews with local leaders and institutions
- Household Surveys to understand access and concerns regarding sanitation
- Information Dissemination via flyers, posters, and community boards

POTENTIAL ENVIRONMENTAL IMPACTS

Introduction

This section outlines the process of impact identification and assessment of impacts in each stage of the proposal. The section also proposes mitigation measures that the project proponent is committed to undertake so as to prevent or reduce the identified impacts.

Impact Identification

The proposed project has a potential of causing a wide range of environmental and social impacts on a number of receptors. The ESIA identify these impacts for the purpose of mitigating the adverse ones or enhancing the benefits. Impact Identification is a process designed to ensure that all potentially significant impacts are identified and considered in the ESIA process. A number of tools are available to assist in impact identification. The simplest and most frequently used, checklist of impacts method was used for this project. Also, professional judgment based on experience from projects of similar nature and superimposing impacts prediction with the baseline conditions of the site and the surrounding areas including Kibaha Municipal Council in general was used in identifying impacts from the proposed project.

Some of the Impacts includes:

- Employment opportunities for locals
- Improved public health and sanitation
- Reduction in groundwater contamination
- Promotion of environmental conservation
- Soil erosion due to land clearing
- Community concerns and opposition to the project
- Dust emissions from excavation and vehicle movement
- Noise pollution from machinery
- Waste generation (construction debris, packaging)
- Oil/fuel leaks contaminating soil and water
- Occupational health and safety risks for workers

Alternative 1: No Project Scenario

- **Description**: This option assumes that no intervention is made in Mitamba area, Lumumba Mtaa to address poor sanitation.
- **Implications**:

- Continued reliance on unsafe on-site sanitation (e.g., poorly constructed pit latrines)
- Increased risk of groundwater contamination and surface water pollution
- Higher prevalence of waterborne diseases
- Social and environmental degradation in a growing urban area

This option does not address urgent sanitation needs or public health risks.

Alternative 2: Alternative site

- **Description**: This involves identifying another location for the FSTP outside Lumumba Mtaa or even outside Pangani Ward.
- **Considerations**:
  - It will be time consuming and additional cost
  - Mitamba area in Lumumba Mtaa is under jurisdiction of Kibaha Municipal hence no compensation needed searching for alternative site could lead to compensation

ENVIRONMENT AND SOCIAL MITIGATION MEASURES

Introduction

Mitigation Measures are "actions" to be applied in order to minimize or alleviate adverse impacts that may be caused by project implementation. A number of enhancement measures for positive impacts and mitigation measures for negative impacts are proposed hereunder. The positive benefits of the project will be maximized and any adverse negative impacts will be avoided or at least minimised/mitigated. The mitigation measures have been defined based on stakeholder input, expert analysis and opinion, experience with similar projects and best engineering practice;

- Limit land clearing to necessary areas only (Construction corridor only).
- Conduct construction during dry periods where feasible.
- Re-vegetate exposed areas as soon as possible.
- Conduct continuous stakeholder engagement and awareness campaigns during and after project implementation.
- Provide clear information on project benefits and odor control.
- Establish a grievance redress mechanism.
- Include community representatives in monitoring and site visits.
- Water spray exposed soil and roads to suppress dust.
- Cover trucks transporting soil and materials.
- Limit vehicle speeds within and around the construction site.
- Provide PPE (dust masks, goggles) to workers.
- Use well-maintained, low-noise machinery.
- Limit construction to daytime hours.

- Provide ear protection to workers.

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 Introduction

The Environmental and Social Management Plan (ESMP) presents the implementation schedule for the proposed mitigation measures to both environmental and social impacts as well as planning for long-term monitoring activities. The ESMP also includes the associated environmental costs needed to implement the recommended mitigation measures. The engineering designs have already included some of the mitigation measures recommended in this report. For instance, the use of shallow, small-diameter sewer pipes minimizes the need for deep excavations, thereby reducing risks of soil erosion, landscape disturbance, and property damage. Additionally, routing the pipes along road reserves and rear plot boundaries helps avoid major roads and private properties, which in turn reduces traffic disruptions and eliminates the need for relocation or compensation.

However the disruptions are expected during construction and maintenance phase of which the setbacks are minor and can be solved through the proposed mitigations measures. Additional recommendations are provided in the ESMP to enable the proposed facilities become more environmentally friendly. The implementation steps will involve DAWASA, the contractor, Kibaha Municipal Council, some utilities providers such as TANESCO, and the local communities at large.

Table 8-1 Provide the ESMP for the proposed construction of Fecal Sludge Treatment Plant to be constructed at Mitamba area, Lumumba Mtaa, Pangani Ward, and Kibaha Municipality, ESMP costs about 130,000,000 Tanzania Shillings.

ENVIRONMENTAL AND SOCIAL MONITORING PLAN

Introduction

Monitoring of the anticipated environmental and social risks and impacts in the receiving environments is important. It helps in determining the effects of the project activities on the environments enhancing understanding of cause effect relationships between human activities and environmental changes, and verifies the accuracy of prediction about the environmental impacts. It ensures compliance with regulatory measures and understanding the degree of implementation of EMP and its effectiveness. The monitoring results are also used extensively during the environmental auditing.

The Tanzanian EIA regulations require the developer to prepare and undertake a monitoring plan and conduct regular auditing. Monitoring is needed to check if and to what extent the impacts are mitigated, benefits enhanced and new problems addressed. Recommendations for monitoring have been included in the ESMP (Table 9-1). The ESMP also assigns responsibilities for monitoring activities. However, the divisional/ward/village environmental committees and municipal environmental committee will participate in the long-term daily monitoring of the project, especially during operation. The total cost for Monitoring is about 98 Million TZS.

CONCEPTUAL DECOMMISSIONING PLAN

Introduction

The conceptual decommissioning plan outlines the strategies that will be adopted at the end of the operational life of the Kibaha Faecal Sludge Treatment Plant (FSTP). Decommissioning involves the systematic closure, dismantling, and rehabilitation of the site to ensure that no long-term environmental or social risks remain. Although the project is expected to operate for several decades, advance planning is crucial to minimize potential adverse impacts during the closure phase and to facilitate the safe transfer of the site for alternative land uses. The conceptual decommissioning plan for the Kibaha FSTP demonstrates foresight in managing the eventual closure of the facility. By emphasizing environmental protection, occupational health and safety, and social safeguards, the plan ensures that decommissioning will be carried out responsibly. The ultimate goal is to restore the site for safe and productive future use while minimizing long-term environmental liabilities and safeguarding community welfare.

Objectives of Decommissioning

The primary objectives of decommissioning are to:

- Ensure safe dismantling and removal of treatment infrastructure.
- Prevent contamination of soil, groundwater, and surface water from residual sludge and construction materials.
- Protect the health and safety of workers and surrounding communities during demolition activities.
- Manage and dispose of waste materials in an environmentally sound manner.
- Restore the project site to a condition suitable for alternative beneficial uses, such as community facilities, open space, or industrial development.
- Minimize social and economic disruption to workers and the host community.

COST BENEFIT ANALYSIS

Overview

The objective of the cost benefit analysis for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba Area in Pangani Ward, Kibaha Municipal Council, is to evaluate the economic, environmental, and social benefits of the project in comparison with the resources required for its implementation. The analysis aims to translate the expected impacts of the project into measurable terms while recognizing that the project's capital investment occurs mainly during the construction phase, whereas the benefits accrue progressively throughout the operational life of the facility.

The proposed FSTP will play a critical role in improving fecal sludge management services within Kibaha Municipality by providing a designated facility for the safe

treatment and disposal of sludge collected from septic tanks and pit latrines. The facility is expected to operate for an estimated design life of approximately 20 Years, during which time it will contribute to improved environmental quality, enhanced public health, and sustainable urban sanitation management.

In sanitation infrastructure projects, the key elements that can be evaluated include improvements in public health conditions, reduction of environmental pollution, operational and maintenance costs, infrastructure investment costs, and the long-term residual value of the treatment facility.

CONCLUSION

The Environmental and Social Management Plan (ESMP) for the proposed Fecal Sludge Treatment Plant (FSTP) at Mitamba Area under Kibaha Municipal Council, to be implemented by DAWASA, provides a structured and systematic framework for identifying, mitigating, monitoring, and managing environmental and social impacts associated with both the construction and operational phases of the project.

The ESMP outlines clearly defined mitigation measures, monitoring indicators, institutional responsibilities, reporting mechanisms, and budget allocations to ensure that all project activities are implemented in compliance with national environmental legislation and applicable international safeguard requirements. Through the effective implementation of the ESMP, adverse impacts such as soil erosion, surface water contamination, dust emissions, noise disturbance, occupational health risks, and temporary disruptions to nearby communities are expected to be reduced to acceptable levels.

However, despite the application of mitigation measures, certain residual environmental and social risks may remain. These include:

- Potential occasional odor emissions during peak sludge offloading or operational upset conditions;
- Increased traffic movement of sludge trucks along access roads, which may pose minor safety risks to local road users;
- Occupational exposure risks to workers handling sludge and treatment chemicals;
- Community perception risks or concerns related to stigma associated with sanitation facilities;
- Risk of accidental spills or system malfunction during extreme rainfall events linked to climate variability.

These residual risks are anticipated to be low to moderate in magnitude and manageable through continuous monitoring, adaptive management, and routine maintenance of treatment infrastructure, emergency preparedness planning, and sustained stakeholder engagement.

To address residual risks, the project will implement:

- Continuous environmental quality monitoring (air, water, noise, and effluent quality);
- Preventive maintenance and contingency planning for plant systems;
- Community grievance redress mechanisms;
- Ongoing occupational health and safety supervision;
- Periodic ESMP performance audits and reporting to relevant authorities.

Overall, the anticipated long-term benefits of the project including improved sanitation services, reduced indiscriminate sludge disposal, enhanced public health outcomes, environmental protection, and local employment opportunities significantly outweigh the identified residual risks.

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

Dar es Salaam Water supply & Sanitation Authority

DAWASA Building, Dunga/Malaga Street,
Mwananyamala Area
P. O. Box 1573, Dar es Salaam. TANZANIA.
Tel. +25522276006/15; Fax: +255222762480;
E-mail: dawasaceo@dawasa.co.tz

Tathmini ya Athari kwa Mazingira na Jamii kwa Mradi pendekezwa wa Ujenzi wa Mfumo rahisi wa ukusanyaji wa maji taka katika Mtaa wa Sinza D, kata ya Sinza, Halmsahauri ya Manispaa ya Ubungo, Mkoa wa Dar es Salaam

Lead Consultant:

Prof. Rubhera RAM Mato (PhD), CEng. (T), Reg. EIA Expert

Mobile: +255754898592; E-Mail: rubheramato@gmail.com

Submitted to:

National Environment Management Council
Regent Estate, Mikocheni**, P. O. Box 63154,Dar es Salaam.**
Tel: +255 22 2774852/ 0713608930;Fax: +255 22 2774901E-mail: gd@nemc.or.tz

Submitted: March, 2026

MUHTASARI USIO WA KIUFUNDI

Tathmini ya Athari kwa Mazingira na Jamii kwa Mradi pendekezwa wa Ujenzi wa Mtambo wa kuchataka maji taka katika Eneo la Mitamba, Mtaa wa Lumumba, Kata ya Pangani, Halmsahauri ya Manispaa ya Kibaha, Mkoa wa Pwani

Mmiliki: Dar es Salaam Water Supply & Sanitation Authority

Mawasliano ya Mmiliki: DAWASA,
DAWASA Building, Dunga/Malaga Street, Mwananyamala
S.L.P 1573, Dar es Salaam. TANZANIA.
Simu. +25522276006/15; Fax: +255222762480;
Barua Pepe: dawasaceo@dawasa.co.tz

Mshauri Mwelekezi: Prof. Rubhera RAM Mato (PhD), CEng. (T), Reg. EIA Expert
S.L.P 35478, Dar es Salaam, Tanzania
Simu: +255754898592
Barua Pepe: rubheramato@gmail.com

Utangulizi wa Mradi

Serikali ya Jamhuri ya Muungano wa Tanzania (GoT) kupitia Dar es Salaam Water and Sewerage Authority (DAWASA) chini ya Wizara ya Maji inapanga kutekeleza Mradi wa Usafi wa Mazingira Nje ya Mfumo wa Majitaka wa Kati (Off Grid Sanitation Project – OGSP) kwa ajili ya kuhudumia maeneo ya pembezoni mwa miji ambayo hayajaunganishwa na mfumo wa majitaka wa kati.

DAWASA imepokea ufadhili kutoka International Development Association (IDA) katika mfumo wa mkopo kwa ajili ya utekelezaji wa mradi huu. Kabla ya utekelezaji wa mradi, sheria za Tanzania zinahitaji kufanyika kwa Tathmini ya Athari kwa Mazingira (EIA) na kupata kibali kutoka mamlaka husika.

Ili kuzingatia matakwa ya kisheria nchini Tanzania, DAWASA inakusudia kutumia sehemu ya fedha za mkopo huo kwa ajili ya huduma za ushauri katika kuandaa Tathmini ya Athari za Mazingira na Jamii (ESIA) pamoja na Mpango wa Uhamishaji na Fidia (Resettlement Action Plan – RAP) kwa ajili ya miradi ya usafi wa mazingira isiyounganishwa na mfumo wa majitaka wa kati.

Mji wa Kibaha uliopo Mkoa wa Pwani umepitia mabadiliko makubwa katika kipindi cha takribani miaka ishirini iliyopita. Awali ukiwa mji mdogo wenye sifa za maeneo ya vijijini, Kibaha imekua kwa kasi kubwa kijamii na kiuchumi kutokana na ukaribu wake na jiji la Dar es Salaam ambalo ni kitovu kikuu cha biashara nchini.

Ukiwa umbali wa takribani kilomita 40 magharibi mwa Dar es Salaam kupitia barabara kuu ya Morogoro, Kibaha imekuwa kivutio cha makazi mapya, shughuli za kibiashara pamoja na taasisi mbalimbali.

Kutokana na changamoto zinazoendelea za mazingira na afya ya jamii zinazotokana na huduma duni za usafi wa mazingira katika maeneo ya mijini na pembezoni mwa miji, Serikali ya Tanzania kupitia Wizara ya Maji kwa kushirikiana na DAWASA inatekeleza Mradi wa Usafi wa Mazingira Nje ya Mfumo wa Majitaka wa Kati (Off-grid Sanitation Project). Mradi huu unafadhiliwa na World Bank na unalenga kuboresha miundombinu ya usafi wa mazingira katika jamii ambazo hazijaunganishwa na mfumo wa majitaka wa kati.

Mradi unaopendekezwa katika Manispaa ya Kibaha ni ujenzi wa Mtambo wa Kuchakata na kutibu Majitaka (Fecal Sludge Treatment Plant – FSTP) katika eneo la Mitamba, Lumumba Mtaa, Kata ya Pangani ndani ya Halmashauri ya Mji Kibaha.

Ujenzi wa Mradi huu utasaidia:

- Kuboresha huduma za usafi wa mazingira mijini kupitia ukusanyaji salama, usafirishaji, matibabu na utupaji wa majitaka ya vyooni.
- Kuzuia uchafuzi wa mazingira.
- Kusaidia maendeleo endelevu ya mji wa Kibaha kwa kuendana na mifumo ya maendeleo ya kitaifa pamoja na viwango vya ulinzi wa mazingira vya Benki ya Dunia.

Tathmini hii ya mazingira imeandaliwa kwa kuzingatia sera za udhibiti wa mazingira za Benki ya Dunia, Sheria ya Usimamizi wa Mazingira ya Tanzania ya mwaka 2004, pamoja na sheria na kanuni nyingine husika. Hati hii inaeleza hatua za kupunguza athari, mpango wa ufuatiliaji, na mfumo wa taasisi utakaosimamia athari zinazoweza kujitokeza.

ASILI YA MRADI

Mradi unaopendekezwa unahusu ujenzi wa Kituo cha Matibabu ya Majitaka ya Vyoo (FSTP) kwa matumizi ya umma katika eneo la Mitamba, Lumumba Mtaa, Kata ya Pangani ndani ya Manispaa ya Kibaha.

Asili ya mradi inalenga kuimarisha ulinzi wa mazingira kupitia usimamizi sahihi wa ukusanyaji, usafirishaji na utupaji wa majitaka ya majumbani.

Kwa mujibu wa Jedwali la Kwanza la Kanuni za Tathmini ya Athari za Mazingira na Ukaguzi (zilizofanyiwa marekebisho mwaka 2018), mradi huu hauhusishi athari kubwa za mazingira. Mradi huu unaangukia katika kundi la Aina B2, ambalo ni shughuli za kiwango cha kati zinazohitaji usajili lakini hazihitaji tathmini kamili ya athari za mazingira. Badala yake, Muhtasari wa Mradi (Project Brief) hupitiwa na kutolewa Cheti cha Tathmini ya Athari za Mazingira.

MAELEZO YA MRADI

Eneo la Mradi

Kituo cha FSTP kitajengwa katika eneo la Mitamba ndani ya Lumumba Mtaa, Kata ya Pangani, Halmashauri ya Mji Kibaha katika Mkoa wa Pwani, umbali wa takribani kilomita 13.7 kutoka kituo cha mji wa Kibaha.

Eneo hili liko pembezoni mwa mji wa Kibaha na limechaguliwa kimkakati ili kuhudumia maeneo ya mijini na pembezoni mwa mji ndani ya manispaa.

Eneo linafikika kupitia barabara ndogo zinazounganisha na barabara kuu ya Morogoro (A7), jambo linalorahisisha usafirishaji wa majitaka pamoja na vifaa vya ujenzi.

Jinsi ya Kufika Eneo la Mradi

Eneo la mradi linapatikana umbali wa takribani kilomita 13.7 kutoka katikati ya mji wa Kibaha kupitia barabara ya Morogoro. Kutoka barabara kuu, eneo linafikika kupitia barabara ndogo ya mtaa inayounganisha makazi na mtandao wa barabara kuu.

Kwa sasa barabara ya kufikia eneo la mradi ni ya udongo (murram) ambayo hupitika vizuri wakati wa kiangazi lakini inaweza kuhitaji kuboreshwa wakati wa msimu wa mvua ili kuruhusu usafirishaji wa vifaa vya ujenzi, magari ya kunyonya majitaka pamoja na magari ya matengenezo.

UMILIKI WA ARDHI

Ardhi iliyotengwa kwa ajili ya mradi wa FSTP imetolewa rasmi kwa DAWASA na Kibaha Town Council. Barua rasmi ya ugawaji wa ardhi imetolewa na imeambatanishwa katika Kiambatisho I, ikithibitisha kuwa eneo hilo ni ardhi ya umma chini ya mamlaka ya Halmashauri ya Mji Kibaha na halina migogoro ya umiliki.

USANIFU WA MRADI

Teknolojia na muundo wa ujenzi uliopendekezwa umezingatia kuunda mfumo wa kutibu maji-taka ya vyooni ambao ni:

- Rahisi
- Wenye gharama nafuu
- Rahisi kuendesha na kutunza
- Unaokidhi viwango vya mazingira vya Baraza la Taifa la Uhifadhi wa Mazingira

Mtambo wa Kuchakata Maji taka wa Mitamba kimepangwa kuwa na muda wa matumizi wa takribani miaka 20, ukizingatia ongezeko la idadi ya watu, ongezeko la majitaka yanayozalishwa, upanuzi wa mji na mabadiliko ya tabianchi.

USHIRIKISHWAJI WA WADAU

Ushirikishwaji wa wadau ni mchakato unaohusisha watu au makundi yanayoathiriwa moja kwa moja au kwa njia isiyo ya moja kwa moja na mradi, pamoja na wale wenye maslahi katika matokeo ya mradi.

Ushirikishwaji wa wadau ulifanyika mara mbili:

- Tarehe **16 Julai 2025** (mkutano wa ndani na viongozi wa serikali za mitaa)
- Tarehe **17 Julai 2025** (mkutano wa hadhara / Baraza la wananchi)

Mikutano ilifanyika katika Shule ya Msingi Lumumba ambapo jamii ilipewa taarifa kuhusu mradi na kutoa maoni yao.

ATHARI ZA MAZINGIRA ZINAZOWEZA KUJITOKEZA

Baadhi ya athari zinazotarajiwa ni pamoja na:

Faida chanya:

- Kuongezeka kwa ajira kwa wakazi wa eneo husika
- Kuboresha afya ya jamii
- Kupunguza uchafuzi wa maji ya chini ya ardhi
- Kukuza uhifadhi wa mazingira

Athari hasi zinazoweza kujitokeza:

- mmomonyoko wa udongo kutokana na usafishaji wa eneo
- vumbi kutokana na uchimbaji na harakati za magari
- kelele kutoka kwa mitambo ya ujenzi
- uzalishaji wa taka za ujenzi
- hatari za kiafya kwa wafanyakazi.

HITIMISHO

Mpango wa Usimamizi wa Mazingira na Jamii (ESMP) kwa mradi wa FSTP katika eneo la Mitamba ndani ya Halmashauri ya Mji Kibaha unatoa mfumo wa kina wa kutambua, kupunguza, kufuatilia na kusimamia athari za mazingira na kijamii zinazoweza kujitokeza wakati wa ujenzi na uendeshaji wa mradi.

Kupitia utekelezaji madhubuti wa hatua za kupunguza athari zilizopendekezwa, athari hasi kama vile mmomonyoko wa udongo, uchafuzi wa maji ya juu, vumbi,

kelele, hatari za afya kwa wafanyakazi na usumbufu wa muda kwa jamii zinatarajiwa kupunguzwa hadi viwango vinavyokubalika.

Hata hivyo, licha ya hatua za kupunguza athari, baadhi ya hatari za mabaki zinaweza kuendelea kuwepo kama vile:

- uwezekano wa harufu wakati wa upakuaji wa majitaka
- kuongezeka kwa harakati za magari ya majitaka
- hatari za kiafya kwa wafanyakazi wanaoshughulika na majitaka
- mitazamo ya jamii kuhusu vituo vya usafi wa mazingira
- uwezekano wa kumwagika kwa majitaka wakati wa mvua kubwa.

Kwa ujumla, faida za muda mrefu za mradi huu ikiwa ni pamoja na kuboreshwa kwa huduma za usafi wa mazingira, kupunguza utupaji holela wa majitaka, kuboresha afya ya jamii, kulinda mazingira na kuongeza ajira kwa wakazi wa eneo husika, zinazidi kwa kiasi kikubwa hatari zilizobainishwa.