ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR THE LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

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FIRM OF EXPERTS

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CERTIFICATION

For and on behalf of:

Tana Water Works Development Agency

This Environmental and Social Impact Assessment (ESIA) Summary Project Report was prepared in accordance with the Environmental Management and Coordination Act (EMCA) 1999 and the Environmental Impact Assessment and Audit Regulations 2003 (revised 2015 & 2019) in order to meet the statutory requirements for the implementation of projects under schedule ii. We, the undersigned, confirm that the contents of this report are a true representation of the ESIA process for the Proposed Last Mile Connectivity of the Meru Sewerage Project.

KEY EXPERTS AND THEMATIC LEADERS ARE AS LISTED BELOW:

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EXECUTIVE SUMMARY

Overview and Project Description

Meru Town and the peri-urban area has an elaborate water supply system constructed in 2002 under a grant from the Government of Japan. The estimated population of the supply area is 118,000 people and about 57% of this population is served by this water supply system, while the rest access water services from existing community water projects. In addition, the town has a sewerage project recently constructed with a capacity to treat wastewater of 11,800m^3 per day. It was funded by the African Development Bank and the Government of Kenya. The project commenced in the year 2018/2019 and was completed in 2023.

The phase 1 project has an elaborate network of trunk sewer lines of over 50Km ranging from DWC 600- 250DN various sections to a newly constructed sewer treatment plant in Rwanyange. These network traverses the town including Makutano, Milimani, Kinoru, Mwandantu, Gitimbine, Kaaga, Gikumene and Kirunga areas, among others. The main lines have been laid and there is need for tertiary connections and secondary lines to join the trunk sewers laid. It is this gap in the provision of adequate sewerage facilities, even as the water supply services have been improving over the years, that the Tana Water Works Development Agency proposes to close by investing in new sewerage facilities and networks to cover most of Meru Town and its environs through the Last Mile Connectivity of the sewerage project.

The analysis of project alternatives for the project highlighted the importance of considering various pathways to ensure the project's social, environmental, and economic benefits. The "No-action" alternative, while maintaining the status quo, would compromise sanitation services for the municipality's residents, leading to continued health risks and environmental strain. Relocating the project or considering alternative wastewater infrastructure could incur additional financial costs, time, and logistical challenges, potentially hindering the project's ability to effectively serve the community.

Ultimately, the proposed last mile connectivity for the Meru Sewerage project emerges as the most viable option, offering efficient waste management solutions that address sanitation challenges within the municipality. Despite potential drawbacks such as noise and soil contamination, the benefits of improved sanitation, employment opportunities, and environmental protection outweigh these concerns. Implementation of the proposed project, as outlined in the Environmental and Social Management Plan, is essential for enhancing the overall

The activities related to the proposed project have been classified into four distinct phases of project implementation as follows:

1. **Pre-construction phase activities**: The main activities during pre-construction phase include resource mobilization, conducting specific studies i.e. feasibility studies, ESIA and RAP, acquisition of necessary permits, tendering services, site handover, handover of drawing and water work plans and site layout to the contractor.

2. **Construction phase activities:** Site preparation, excavating trenches for laying sewer pipes and installing other infrastructure; sewer line installation; Constructing manholes

and access points at regular intervals along the sewer line for maintenance and inspection purposes and installing frames, covers, and other appurtenances to secure and protect access points

3. **Operational phase activities**: Upon completion of the construction phase, the sewerage system in Meru will stand ready to provide reliable sanitation infrastructure. The management and operation of the newly constructed sewerage treatment and system will be entrusted to the Meru Water and Sewerage Services, in accordance with the provisions of the Water Act 2016 and the policies set forth by WASREB.

4. **Decommissioning phase activities**: The decommissioning of the sewerage system will be guided by a decommissioning plan which will guide the process of the structures to be demolished. Non-reusable materials from the demolition process will be sold to licensed scrap metal dealers. The affected land will undergo landscaping efforts, including the planting of appropriate indigenous trees and grass, to restore its natural state.

Brief description of the project site Environmental and Social Conditions

The proposed Last Mile Connectivity (LMC) project for the Meru sewerage is Meru Municipality, a region characterized by diverse biophysical and socio-economic environments. Geographically, Meru County lies east of Mount Kenya, encompassing an area of 6,936.2 square kilometers, with a significant portion designated as forest. The project area, located in Meru Town, serves as the administrative center and is well-connected by major roads such as the Meru-Nairobi highway. Topographically, the region varies from the lower elevation areas adjacent to the Kinyarita River to the higher reaches bordering Mt. Kenya, influencing its hydrology and drainage patterns.

The biophysical environment of the project area is marked by its diverse topography, hydrology, geology, soils, biodiversity, and climate. With altitudes ranging from 1265 to 1799 meters above sea level, the region experiences a bimodal rainfall pattern, supporting diverse flora and fauna. The municipality area includes portions of the Meru and Imenti forests, hosting a rich biodiversity including endemic plant species and a variety of wildlife such as elephants, hyenas, and numerous bird species. The soil structure, predominantly volcanic, supports agricultural activities, contributing to the local economy alongside other land uses like urban development and forestry.

Socioeconomically, Meru Municipality exhibits a mix of settlement patterns, infrastructure, and access to essential services like water, sanitation, energy, education, and healthcare. Settlements range from urban centers like Makutano and Kinoru, characterized by high population density and commercial activities, to rural villages engaged in subsistence farming. The area benefits from an extensive road network and access to electricity from the national grid, while water supply and sanitation services are managed by the Meru Water and Sewerage Services. The municipality hosts a variety of educational institutions from early childhood development to tertiary education, alongside a diverse healthcare sector comprising clinics, hospitals, and dispensaries, ensuring the well-being of its residents.

Sensitive receptors identified for the LMC project include residential areas, educational and healthcare facilities, community centers, and water sources like the Kathita River. These receptors represent populations and environments potentially impacted by the project's construction and operation activities. However, measures outlined in the Environmental and Social Management Plan aim to mitigate adverse effects and safeguard these receptors. Overall, the proposed LMC project seeks to enhance sanitation services within Meru Municipality while considering the environmental and socio-economic dynamics of the region, ultimately contributing to the well-being and sustainable development of the local community.

Policy, Legal and Regulatory Framework

Implementation of the proposed Meru Sewerage LMC Project shall be guided by various Kenyan policies and legislation to ensure project sustainability and environmental protection. Below is a concise overview of the pertinent legislations that the project will comply with:

Table 0-1: Strategies and Government Policies

Policy/Strategy	Focus	Key Provisions/Actions
Constitution of Kenya, 2010	Environmental preservation and conservation	- Promote public participation in environmental management, protection, and conservation. - Institute mechanisms for environmental impact assessment, environmental auditing, and environmental monitoring. - Eliminate processes and activities that pose potential harm to the environment.
Kenya Vision 2030	Development agenda	- Aim for a globally competitive middle-income country by 2030. - Focus on education, health, water, environment, housing, and urbanization. - Implement through Medium-Term Plans (MTP) with key policy actions and programs.
Sessional Paper No 1 on National Water Policy 2021	Water sector challenges and responses	- Respond to challenges facing the water sector. - Re-engineer the water sector to achieve sustainable development in alignment with SDGs. - Increase access to sewerage services and improve water supply.
National Policy on Water Resources Management (1999)	Water resource preservation and management	- Preserve, conserve, and protect available water resources. - Ensure water allocation in a sustainable, rational, and economic way. - Provide water of good quality and quantity while ensuring safe disposal of wastewater.
Sessional Paper No. 10 of 2014 on National Environment Policy	Environmental management framework	- Ensure optimal use of natural resources while improving environmental quality. - Conserve natural resources for present and future generations. - Integrate environmental conservation with socio-economic development.
National Environmental	Sanitation and hygiene improvement	- Address environmental sanitation and hygiene matters. - Enhance dignity, health,

Policy/Strategy	Focus	Key Provisions/Actions
Sanitation and Hygiene Policy, 2016		welfare, and social well-being through improved sanitation and hygiene practices.
Gender Policy, 2011	Gender mainstreaming	- Mainstream gender concerns in the national development process. - Improve social, legal, economic, and cultural conditions for women, men, girls, and boys. - Integrate gender equality objectives and indicators into ministerial strategies and programs.

Table 0-0-2: Kenyan Legislative Framework

Legislation	Summary
Environmental Management and Coordination Act (EMCA)	Provides the legal framework for environmental management, coordination, and regulation. It establishes lead agencies to oversee sectoral activities. Categorizes projects based on risk levels for environmental impact assessment (EIA) purposes.
Environmental (Impact Assessment and Audit) Regulations	Specifies procedures and guidelines for conducting ESIA and Environmental Audit, ensuring the submission of comprehensive reports to NEMA for effective environmental management.
Environmental Management and Coordination (Water Quality)	Regulates water usage, ensuring protection of water sources and setting standards for discharge of effluents and sewage into aquatic environments.
Environmental Management and Coordination (Waste Management)	Provides guidelines for the storage, transportation, and disposal of various waste streams, ensuring proper waste management practices are followed.
Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control)	Sets regulations to control noise and vibration pollution, establishing permissible noise levels and factors for determining acceptable noise levels.
Environmental Management and Coordination (Air Quality)	Addresses prevention, control, and abatement of air pollution, specifying measures for both stationary and mobile sources, and setting permissible occupational exposure limits.
Water Act	Regulates water resources management and development, providing provisions for water ownership, permits, and community projects.
Land Act	Governs land administration and management, including procedures for compulsory land acquisition and settlement programs.
Occupational Safety and Health Act (OSHA)	Ensures safety, health, and welfare of persons at work, requiring measures to prevent emissions of harmful substances into the atmosphere.
Public Health Act	Prohibits conditions endangering human health and sets standards for waste disposal and water quality.
County Governments Act	Establishes principles for citizen participation in county governance, ensuring access to information and participation in decision-making processes.
National Gender and Equality Act	Promotes gender equality and freedom from discrimination, ensuring gender mainstreaming in development projects.

Legislation	Summary
Employment Act	Regulates trade unions, trade disputes, and employment relations, promoting sound labour relations and fair labour practices.
Climate Change Act 2016	The Act provides a regulatory framework aimed at enhancing responses to climate change, promoting mechanisms, and implementing measures to support low-carbon climate development.

Table 0-3: Relevant Institutional Framework

Institution	Responsibilities	Relevance to Project
Land and Environment Court Act, 2012	- Hear and determine disputes related to environment and land. - Regulate practice and procedure for land and environment matters.	Land acquisition, disputes resolution, adherence to court requirements during project implementation.
National Environment Council	- Policy formulation and direction. - Setting national goals and objectives for environmental protection.	Ensuring project compliance with national environmental goals and objectives.
National Environment Management Authority (NEMA)	- Supervision and coordination over environmental matters. - Implementation of environmental policies. - Setting environmental quality standards.	Approval of the project, participation in construction environmental management, and annual audits review.
County Government of Meru	- Provision of various services including environment management, waste management, and control of environmental degradation.	Ensuring sound waste management and environmental control within the jurisdiction, overseeing project impacts.
Water Resources Authority (WRA)	- Management and regulation of water resources.	Regulation and oversight of water-related aspects of the project, ensuring sustainable use of water resources.
Water Services Regulatory Board (WASREB)	- Regulation and oversight of water service provision.	Ensuring compliance with water service regulations and standards for the project's water-related activities.
Water Services Trust Fund (WSTF)	- Financing and support for water service projects.	Potential funding and support for water-related components of the project, enhancing access to water services.

Table 0-2 presents the applicable AfDB's Environmental and Social Operational Safeguards (OSs) and their relevance to the proposed Meru Sewer LMC project.

Table 0-2: Applicable African Development Bank OSs

Operational Safeguard	**Relevance to Meru Sewer Project**
OS 1: Assessment and Management of Environmental and Social Risk and Impact	The project has undergone a comprehensive Environmental and Social Impact Assessment. The ESIA Process adhered to the NEMA and the AfDB Operational Safeguards to the letter. All the stakeholders with interest in the project including the PAPs were involved in the entire process. This culminated to the development of an ESIA report with a comprehensive Environmental and Social Management Plan to ensure that all the impacts of the projects are duly.
OS 2: Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement	The Meru LMC for the Sewerage Project has avoided involuntary resettlement by utilizing the road reserve. In addition, a Resettlement Action Plan (RAP) has been developed to address any potential impacts on Project Affected Persons (PAPs), ensuring adequate compensation if necessary.
OS 3: Habitat and Biodiversity Conservation, and Sustainable Management of Living Natural Resources	The Environmental and Social Impact Assessment (ESIA) process included an assessment of the project's impact on biodiversity and ecosystems, with mitigation measures outlined in the ESMP to prevent severe impacts. The proposed development poses minimal threat to the flora and fauna present in and within the municipality. Less environmentally sensitive ecosystems exist within the project area, while the ecologically sensitive areas have been safeguarded by the provisions outlined in the Environmental and Social Management Plan. There is no flora or fauna listed in the IUCN Red List, which denotes species at risk, will be affected by the project.
OS 4: Resource Efficiency and Pollution Prevention and Management	As preliminary of the project a Waste Management Plan and an Effluent Discharge Control Plan has been developed to guide waste reduction, segregation, collection, and disposal practices, ensuring compliance with international best practices. Solid waste generated during the sewerage treatment process will be recycled through composting and sold as manure to rural farmers. Effluent water from the treatment process will undergo testing before release into the environment or use for irrigation purposes resource efficiency in Meru Sewer Project.
OS 5: Labour and Working Conditions	The contractor will adhere to all the best practices to ensure the health and safety of employees is well taken care off. Specific measures shall be undertaken by the contractor in conjunction with the proponent to protect vulnerable groups of workers, such as women, persons with disabilities, and youth (if any

Operational Safeguard	Relevance to Meru Sewer Project
	are employed in accordance with relevant regulations), ensuring they are not exploited and are provided with necessary support.

Major and Moderate impacts

Beneficial Impacts of the Projects

- **Improved Sanitation and Public Health:** Last-mile connectivity will ensure that more households and communities have access to proper sanitation facilities.
- **Environmental Protection:** Proper sewerage systems prevent pollution of water bodies, soil, and air by safely disposing of sewage and wastewater.
- **Enhanced Quality of Life:** Access to reliable sewerage services shall contribute to a cleaner and healthier living environment within Meru municipality.
- **Economic Development:** Improved sanitation infrastructure will stimulate economic growth by attracting investments, promoting tourism, and enhancing property values.
- **Social Equity and Inclusion:** The proposed Last-mile connectivity of the Meru Sewer will ensure that underserved communities, including low-income households and informal settlements, have equitable access to sanitation services.
- **Water Conservation:** Proper disposal of wastewater through sewerage systems will help to conserve freshwater resources by minimizing contamination and pollution.
- **Mitigation of Water Pollution:** By diverting sewage away from natural water sources, last-mile connectivity reduces the risk of water pollution, which can harm aquatic ecosystems, fisheries, and recreational areas
- **Compliance with Regulatory Standards:** The implementation of last-mile connectivity aligns with national and international standards for sanitation and environmental protection, ensuring compliance with regulatory requirements and enhancing the project's sustainability.
- **Long-Term Cost Savings:** While initial investment costs may be significant, the long-term benefits of last-mile connectivity, such as reduced healthcare expenses, increased productivity, and environmental conservation, outweigh the costs, resulting in overall cost savings for the community and government authorities

Negative Impacts during Construction Phase

- Biodiversity loss and habitat destruction brought by clearance for the excavation of trenches and manholes for the LMC Sewer lines
- Disturbance of utilities mainly the underground utilities that may be tempered with during excavation compromising service delivery within the municipality
- Public Health and Safety Concerns due to the machinery and earthworks associated with the development of the LMC Project
- Traffic congestion brought by disturbance of road utilities during the implementation of the project particularly on road crossings.

- Solid waste Generation due to the plastic packaging for materials, debris and pipe cuttings
- Air Pollution and dust generation will be triggered by moving machinery and transportation vehicle
- Water Pollution as Sediment and construction debris, including concrete, asphalt, and metal fragments, can be washed into stormwater drains and creeks during rainfall events, compromising aquatic ecosystems.
- The machines to be used in the sewerline development may generate high levels of noise, particularly during excavation, trenching, and breaking of concrete or asphalt surfaces. may be affected by occasional noise from these activities, it can be managed within acceptable limits.
- The construction activities are expected disrupt regular business operations within Meru town, Road closures, traffic diversions, and noise pollution can impact accessibility to commercial establishments, leading to decreased foot traffic and sales.
- Individuals, particularly workers, may be in a situation subjected to sexual harassment, abuse, coercion, or exploitation in the context of their employment on LMC sewer construction sites. The exploitation may occur due to various factors, including power imbalances, inadequate policies and safeguards, and a lack of awareness or accountability.
- The influx of workers, who may not have ties to the community and are often away from their families for extended periods, can lead to temporary spikes in crime rates.
- Conflicts may arise from various stakeholders, including the local community, project beneficiaries, and contractor workers. These conflicts can stem from factors including land acquisition, environmental concerns, labour issues, and disruptions to daily life.

Negative Impacts During Operation Phase

- The Sewerage systems failures due to increased pressure on the system can lead to discharge of untreated or partially treated wastewater into water bodies.
- Over time, sewerage systems may experience deterioration and structural failures as poorly maintained sewerage systems can pose significant public health risks by spreading waterborne infections.
- The increased accumulation of sewerage waste in Rwanyange area can stimulate changes in the ecosystem. The development of sewerage systems would attract other species while it displaces others.
- Sewerage systems particularly at the treatment interface will generate potential unpleasant odors and visual pollution, especially whenever inadequate wastewater treatment is done.
- Communities located near poorly managed sewerage systems may experience social stigma and discrimination due to the perception of living in unhygienic or polluted environments. This can lead to social isolation, marginalization, and disparities in access to basic services and amenities.
- The intentional and malicious acts aimed at damaging, destroying, or tampering with components of the sewer system can end up leading to sanitation catastrophes.

- During the operation and maintenance phases of the Last Mile Connectivity (LMC) sewerage project in Meru Municipality, several occupational health and safety issues may arise.

Stake holder Consultations

The stakeholder engagement methods adopted for the last-mile connectivity of the Meru Sewerage Project involved a systematic approach to involving all relevant stakeholders in the planning, implementation, and monitoring of the project.

The consulting team in conjunction with the proponents at first conducted a stakeholder analysis to identify all individuals, groups, organizations, and institutions that may be affected by or have an interest in the project. All the stakeholders were categorised based on their level of influence, interest, and importance to the project. Table 0-3 presents the stakeholders identified during the study.

Table 0-3: Key Stakeholders Consulted

Category of stakeholder	**Stakeholder consulted**
Project Proponent	• TWWDA staff
Meru County Government	• County Executive (Ministry of Environ, Water and Natural Resources) • MEWASS
Public Administration	• County Commissioner, Meru County • DCC Igembe North • ACCs • Chiefs
General public	• Community barazas
Key Ministries and related agencies	• Tana Water Works Development Agency • Water Resources Management Authority • Public Health & Sanitation • Lands office • Ministry of lands • Directorate of Occupational Health and Safety Services

The key stakeholders who were interviewed for this project included individuals from different levels, such as Public Administration community members, managers of key institutions, and business owners within the project environs.

To gather input from important stakeholders, community and other parties potentially influenced or interested, several public consultation meetings were conducted. These meetings had the objective of engaging community members, interested parties, administrative authorities, crucial personnel from the County level, as well as ward representatives at different locations and days. A summary of the meetings held during the ESIA study are summarised in the table below.

Table 0-4: Public Meetings Conducted

Date	Venue	Interested Persons	Attendance

28th February 2024	DCC's Boardroom Meru	Community and the Public Administration	18 (8M, 10F)
29th February 2024	Meru Municipal Hall	Community and PAP's	40 (18M, 22F)
29th February 2024		Community	
7th March 2024	Kinoru Stadium Hall	Municipality Business Community and the community	78 (53M, 25F)

ESMP

Table 0-5: Environmental and Social Management and Monitoring Plan

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
CONSTRUCTION PHASE					
Environmental Issues					
Biodiversity loss and habitat destruction	• Tress of cultural and environmental importance shall be avoided by all means possible • Where possible the contractor to exercise selective removal of mature, indigenous trees and vegetation • Any area around the project site that will not be used for construction purposes will be restored and landscaped to the original state with addition of aesthetic beauty by planting indigenous trees .	Contractor TWWDA	Tree loss area	Continuous	200,000
Disturbance of utilities	• Use non-destructive excavation techniques • Coordinate with utility providers to relocate or protect underground infrastructure as needed to accommodate sewer line construction. • Prior to construction, the proponents and contractor should establish temporary alternative water supply sources for the residents. • Divide the construction process into phases to minimize the area of disturbance at any given time. • Implement controlled excavation techniques to minimize the disturbance to the surrounding pipes. • Involve the local community in the planning and execution of construction activities.	TWWDA Contractor	Bursts and terminations caused	Continuous	1,000,000
Public Health and Safety Concerns	• Site Protection: Hoarding will restrict access to the sensitive construction sites, preventing unauthorized entry and accidents.	TWWDA Contractor	Incidences and near misses record	Continuous	10,000,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• The open trenches excavated always be covered at all times whenever possible if not a reflective barricade shall be done. • Clear signage to warn the public of construction hazards, to be erected at points of work hence promoting safety awareness. • Workers to be provided with appropriate protective gear such as helmets, goggles, gloves, and safety shoes. • Workers will receive first aid training, and a first-aid kit will be available on-site for prompt treatment of injuries. • A register will track injuries, near misses, and safety incidents, facilitating analysis for improvement. • Delivery drivers will be instructed to drive safely, especially near settlements, to prevent accidents. • A plan to outline procedures for accident response, ensuring a coordinated and timely response. • Contact information for emergency services will be readily available on-site for quick access				
Traffic congestion	• Planning construction activities to minimize disruption during peak travel times or major events can help reduce traffic congestion. • Employing traffic marshals • Implementing effective traffic management plans, including temporary traffic control measures, signage, and flagging operations, can help maintain traffic flow and minimize delays.	TWWDA Contractor	Traffic flow	Continuous	1,000,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• Providing information to motorists about alternative routes and detours can help distribute traffic away from congested areas. • Engaging with the community and stakeholders through public outreach and communication campaigns can raise awareness about construction-related traffic impacts and encourage cooperation and understanding during the project. • Collaborating with local transportation agencies and authorities to coordinate construction schedules.				
Solid waste Generation	• Implement measures to minimize waste generation, such as optimizing pipe lengths to reduce offcuts • Segregate construction waste at the source and prioritize recycling of materials such as concrete, metal, and asphalt. • Ensure proper disposal of non-recyclable waste by transporting it to approved landfill facilities. • Identify and segregate hazardous waste streams, such as contaminated soil or construction chemicals, and handle them according to applicable hazardous waste regulations. • Monitoring and Compliance: Monitor solid waste generation and disposal activities throughout the construction process to ensure compliance with waste management plans and regulatory requirements. • Implement the Waste Management Plan:	Contractor	Litter on site	Continuous	300,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• The excavation will be done according to the planned work and designs.				
Air Pollution	• Watering all active construction areas when necessary to reduce dust emission. • Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard. • Project to be undertaken in phases to cushion the cumulative effects of dust, which would be great in case the project is done at once. • Carry out suitable maintenance on all machinery to be used to avoid the emission of noxious gases. • Drivers and machine operator to avoid unnecessary running of motor vehicle engines and machinery when not in use. • Use of wet methods through water sprays and mists as dust suppression measures • Provision of suitable PPE/C such as nose masks to the workers and staff on site.	Contractor	Air Quality	Continuous	200,000
Water Pollution	• Construct siltation basins or sedimentation ponds at strategic locations to capture sediment-laden runoff from construction activities. • Establish vegetative buffer strips along watercourses and drainage channels to help filter and trap sediment and pollutants before they reach surface water. • Implement stormwater management practices such as detention ponds, vegetated swales, and permeable pavements to capture and treat runoff	Contractor	Water Quality test results	Continuous	200,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	from construction sites before it is discharged into water bodies. • Develop spill prevention and response plans to minimize the risk of sewage spills or leaks during construction activities. • Conduct regular water quality monitoring to assess the impact of construction activities on nearby water bodies. • Collection of Oils and Greases: Oils and greases resulting from repair and maintenance activities will be collected in designated containers to prevent their release into the environment. • Waste from sanitation facilities will be collected and transported by a licensed waste transporter to ensure proper disposal and prevent contamination of water sources				
Noise and Vibrations	• Construction activities that generate significant noise to be scheduled during daytime hours. • Utilize construction machinery and equipment that are designed to produce less noise. • Install temporary noise barriers or enclosures around construction sites to contain and reduce noise levels. • Implement noise-reducing construction techniques and employing low-noise construction methods wherever possible.	Contractor	Noise Levels	Continuous	10,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• Maintain open communication with nearby residents and stakeholders throughout the construction process. Provide advance notice of upcoming noisy construction activities. • Adhere to the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding noise limits at the workplace.				
Disturbance of Enterprises	• Maintain regular communication with affected businesses to provide updates on construction schedules, anticipated disruptions, and mitigation measures. • Seek alternative access routes or pedestrian pathways to businesses affected by road closures or construction activities. The contractor to provide clear • Schedule construction activities during off-peak hours or non-business hours whenever possible. • Implement the RAP	TWWDA Contractor	Complains record	Continuous	100,000
Social Issues					
Sexual Exploitation and Abuse	• Establish clear policies prohibiting sexual harassment and exploitation in the workplace and ensure that workers are aware of their rights and avenues for reporting. • Provide comprehensive training to all workers, supervisors, and management on preventing	Contractor / TWWDA	Mitigation plan for GBV occurring at the community level as a result of project implementation	Throughout construction Period	250,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	sexual exploitation and creating a safe and respectful work environment. • Implement confidential and accessible complaint mechanisms for reporting incidents of sexual exploitation, ensuring that victims can seek assistance without fear of reprisal. • Provide victims of sexual exploitation with access to medical care, counselling, legal assistance, and other support services to address their immediate needs and facilitate their recovery		Number of GBV cases happening at the community level that receive survivor centred referral and care		
Increased Crime	• Foster positive relationships between construction teams and the local community through regular communication, outreach programs, and community meetings. • Employ security officers on site • Collaborate with local police and public administration to address security concerns and deploy resources effectively. Joint patrols, crime prevention initiatives, and information-sharing mechanisms can enhance safety and security in construction zones. • The contractor to provide employment opportunities for local residents in construction-related roles, thereby reducing reliance on transient labour and fostering a sense of ownership and investment in the project's success.	TWWDA Contractor Kenya Police Service Public administration	Crime reported on site	Continuous	500,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• Educate community members about crime prevention strategies, the importance of reporting suspicious activity, and available support services				
Project related conflicts	• Adhere to the provisions in the Grievance readdress mechanism	TWWDA	Reported conflicts in the GRM Log	Continuous	Nil
TOTAL		**13,760,000.00**			
OPERATION PHASE					
Water Pollution	• Implement advanced treatment technologies to remove a broader range of pollutants. • Enhance monitoring and enforcement of discharge permits to ensure compliance with water quality standards. • Invest in green infrastructure solutions like constructed wetlands or vegetated buffers to naturally filter and treat wastewater before it enters water bodies. • Adhere to the provisions of EMCA (Water quality Regulations)	MeWaSS	Water quality in the drainage area	Monthly	**120, 000**
Spread of Water borne diseases	• The managing team should ensure that all sewage undergoes proper treatment before discharge into water bodies. • Conduct routine monitoring and testing of wastewater to assess its quality and ensure compliance with water quality standards for timely corrective actions.	MeWaSS County Public Health	Incidences of water borne diseases Water tests	Monthly	**150,000**

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• Invest in the maintenance, and upgrading of sewerage infrastructure that improve efficiency including sewage treatment plants and sewer lines • Develop and implement emergency response plans to address sewage spills, leaks, or other incidents that may pose a risk to public health				
Ecological Changes	• Conduct thorough Biodiversity Assessment prior to construction to identify and minimize impacts on sensitive habitats. • Continuously monitor the effluent chemical composition • Develop an efficient Effluent discharge Plan • Adhere to the biodiversity management plan • Implement measures to minimize land disturbance and habitat loss during operation. • Implement habitat restoration or creation projects to offset any unavoidable habitat loss.	MeWaSS	Biodiversity changes	Annual Biodiversity Assessment Annual Environmental Audits	**400,000**
Odour and Aesthetic Issues	• Implement odour control technologies such as activated carbon filters or biofilters to mitigate odours emitted from treatment processes. • Optimise the treatment works and technologies to minimise the odour from the plant release • Creating natural buffer zones around the facility can help mitigate the impact of odours on nearby residents and ecosystems	MeWaSS	Smell and air quality test	Continuous	**100,000**

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
Social Stigma and Discrimination	• Engage with local communities to understand their concerns, perceptions, and cultural beliefs regarding sewer systems. • Conduct educational campaigns to dispel myths, misconceptions, and negative stereotypes associated with sewer systems. • Address concerns related to health risks and safety associated with sewer systems through effective risk communication and public health interventions • Celebrate achievements and successes in sewer projects to instil a sense of community pride and ownership. • The WSP to conduct CSR activities for the stigmatized communities • Implement behavioural change interventions to promote positive sanitation and hygiene practices within communities. • Build the capacity of local communities to actively participate in sewer system management, maintenance, and decision-making processes. • Ensure that sewer project is inclusive and accessible to all members of the community, including marginalized or vulnerable groups.	MeWaSS County Government of Meru Public Health	Reports	Continuous	**150,000**
Vandalism	• Foster positive relationships with the community through education, outreach, and collaboration to	MeWaSS Kenya Police Service	OB reports	Continuous	**100,000**

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	promote a sense of ownership and responsibility for sewer infrastructure. • Implement surveillance cameras, lighting, fencing, and security patrols to deter vandals and enhance the security of critical sewer facilities. • Raise awareness about the impacts of vandalism on public health, the environment, and community well-being, and encourage reporting of suspicious activities to authorities. • Enforce strict penalties and legal consequences for acts of vandalism, including fines, restitution, and criminal prosecution, to deter future offenses and hold perpetrators accountable		Crime incidences on water and sanitation infrastructure		
Occupational Health and Safety Concerns	• Provide comprehensive training to workers on occupational safety and health protocols, including hazard identification, safe work practices, and emergency procedures. • Implement a permit-to-work system for confined space entry and other high-risk activities, ensuring that proper safety precautions are in place before work begins. • Conduct regular inspections and maintenance of equipment and infrastructure to identify and address potential hazards promptly. • Provide appropriate personal protective equipment (PPE) such as gloves, goggles,	MeWaSS	Number of accidents and near misses	Continuous	**2,000,000**

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	respirators, and protective clothing to workers, and ensure its proper use and maintenance. • Establish a system for reporting and investigating accidents, near misses, and hazardous conditions, and take corrective actions to prevent recurrence. • Implement engineering controls such as barriers, and guards to minimize exposure to hazards. • Develop and communicate standard operating procedures (SOPs) for all tasks, emphasizing safety precautions and risk mitigation measures. • Monitor environmental factors including noise levels, air quality, and temperature to ensure compliance with occupational safety and health standards. • Provide access to medical facilities and emergency response services in case of injuries or health emergencies. • Promote a safety culture within the WSP through regular safety meetings, training sessions, and awareness campaigns, encouraging active participation and collaboration among workers and management				
TOTALS		**2,900,000.00**			

ESMP Implementation arrangements

Table 0-6: Roles and Responsibilities in ESMP Implementation

Entity	Roles and Responsibilities in ESMMP Implementation
Tana Water Works Development Agency (TWWDA)	• To ensure that all project operations are conducted in accordance with their internal environmental policies and in accordance with the ESMP • Ensure that all authorizations/Approvals/Licenses required for project implementation are obtained; • Request the contractor operates on the basis of valid Authorizations/approvals/licenses for the activities to be implemented; • Ensure that the ESMP is an integral part of the contract document with the Contractor and that the contractor will be responsible for its implementation; • Establish institutional linkages with relevant parties in the project implementation as needed, or designate a representative for that purpose; • Ensure that the various project activities comply with the mitigation measures proposed in the Environmental Management and Monitoring Program (ESMMP); • Make regular inspections to all the different activities with regard to social aspects, health, safety and environment and check for any non-conformity with the ESMMP attributable to the Contractor and identify the steps taken for its correction
National Environmental Management Authority (NEMA)	Regulatory function • Co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plans, programmes and projects. • Identify projects and programmes or types of projects and programmes, plans and policies for which environmental audit or environmental monitoring must be conducted under this Act; • Monitor and assess activities, including activities being carried out by relevant lead agencies, in order to ensure that the environment is not degraded by such activities
MEWASS	• Operate and maintain the Sewer system in a manner that will reduce contamination • Carry out effluent quality analysis in collaboration with other government lead agencies • Ensure treated wastewater and sludge for re-use/disposal meets accepted health standards • Conduct regular monitoring and inspection to ensure facilities are not interfered with • Ensure that effluent discharged from industries into the sewage system is treated and meets effluent discharge quality standards
Contractor	• Prepare own ESMP implementation plan as well as a health and safety action plan within 30 days of signing of the contract.

Entity	Roles and Responsibilities in ESMMP Implementation
	• Operate on the basis of valid Licenses/Approvals/Authorizations for the activities to be implemented; • Prevent or minimize the occurrence of accidents which might cause damage to the environment and be able to respond positively to an accident if it occurs; • Ensure compliance to working procedures and environmental requirements and health and safety established in the contract with the Proponent; • Minimize environmental damage, waste control, avoid pollution, prevent loss or damage on natural resources and minimize the effects on the users and occupants of surrounding lands and the public; • Provide Personal Protective Equipment (PPE) to workers which are appropriate to the tasks to be performed and ensure that it is used; • Manage the complaints process on the elements that fall within its jurisdiction, or refer complaints to the Proponent, so that they can receive treatment/appropriate response;
Supervising Consultant/ Resident Engineer	• To ensure that the ESMMP is up to-date and is being used by the contractor. • Conduct periodic audits of the ESMMP to ensure that its performance is as expected
Meru County Government	• The relevant departmental officers in the above county government will be called upon where necessary during Project implementation to provide the necessary permits and advisory services to the project implementers
Directorate of Occupational Safety and Health Services (DOSHS)	• To register the project site as a work station and subsequent enforcement of relevant provisions in occupational safety and health in line with Occupational Safety and Health Act, 2007.
Water Resource Authority (WRA)	• Monitor and enforce conditions attached to water permits and water use; • Regulate and protect water resources quality from adverse impacts; • Regulate and protect water resources from adverse impacts; • Regulate water infrastructure, use and effluent discharge; • Work with the beneficiary communities to manage and protect water catchments; • Establish water resources monitoring networks

Conclusion and Recommendations

The Meru sewerage Last Mile Connectivity project holds significant promise for enhancing sanitation infrastructure and improving the quality of life for residents in the Meru municipality. The extension of sewer lines to previously under-served areas will address longstanding challenges related to inadequate sanitation and wastewater management. However, the successful implementation of the project requires careful consideration of environmental and social factors, as well as proactive measures to mitigate potential risks and maximize benefits.

The ESIA team has identified a range of anticipated environmental and social impacts and designed adequate enhancement and mitigation measures to ensure maximum benefits from the proposed project are achieved and adverse impacts are well mitigated. A comprehensive Environmental and Social Management and Monitoring Plan has also been developed encompassing a range of measures aimed at safeguarding the environment, promoting social inclusivity, preserving public health, and fostering economic sustainability.

The ESIA team therefore recommends approval and licensing of the proposed Meru Sewerage LMC Project as a step towards improving access to proper sanitation facilities and generally enhancing the overall quality of life to project beneficiaries. The following key recommendations should be taken into consideration during project implementation:

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMNS AND ABBREVIATIONS

ACC	Assistant County Commissioner
AFDB	African Development Bank
BOD	Biochemical Oxygen Demand
BoQ	Bill of Quantities
CAJ	Commission on Administrative Justice
CBD	Convention on Biological Diversity
CIDP	County Integrated Development Plan
CPR	Comprehensive Project Report
CSR	Community Social Responsibility
DCC	Deputy County Commissioner
Dn	Diameter Nominal
DOSHS	Directorate of Occupational Safety and Health Services
DWC	Double Wall Corrugated
EA	Environmental Audit
EMCA	Environmental Management Coordination Act
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMMP	Environmental, Social Management and Monitoring Plan
EPC	Engineering Procurement and Construction
GBV	Gender Based Violence
GDP	Gross Domestic Product
GHG	Green House Gases
GOK	Government of Kenya
GI	Galvanized Iron
GIS	Geographic Information System
Ha	Hectares
HDPE	High Density Polyethylene
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature
KENHA	Kenya National Highways Authority
KeMU	Kenya Methodist University
KERRA	Kenya Rural Roads Authority
Km	Kilometre
KPHC	Kenya Population and Housing Census

KURA	Kenya Urban Roads Authority
LMC	Last Mile Connectivity
MDAs	Ministries, Departments and Agencies
MEAs	Multilateral Environmental Agreements
MeWaSS	Meru Water and Sewerage Services
MTP	Medium- Term Plans
MUST	Meru University Science and Technology
NEAP	National Environmental Action Plan
NEMA	National Environmental Management Authority
OS	Operational Safeguards
OSHA	Occupational Safety and Health Act
PAPs	Project Affected Person(s)
PCU	Project Coordination Unit
PPE	Personal Protective Equipment
PVC	Polymerizing Vinyl Chloride / Polyvinyl Chloride
RAP	Resettlement Action Plan
SEA	Strategic Environment Assessment
ToR	Terms of Reference
TWWDA	Tana Water Works Development Agency
WASH	Water Sanitation and Hygiene
WRA	Water Resources Authority
WRUA	Water Resource Users Association
WSP	Water Service Provider
uPVC	Unplasticized Polyvinyl Chloride

1. INTRODUCTION

1.1. Background Information

Efficient sewerage management is crucial for urban infrastructure, safeguarding public health, and promoting environmental sustainability. Integrated approaches combining sewage treatment with other urban systems maximize efficiency and reduce environmental impacts. Effective sewage management enhances urban infrastructure resilience against challenges like flooding and extreme weather. It also aligns with the sixth Sustainable Development Goal, ensuring universal access to safe water and sanitation. Inadequate sewage management can pollute water, soil, and air, posing risks to health and the environment. Reliable sewer systems provide sanitation services, improving well-being and supporting economic development by attracting investment, promoting tourism, and creating jobs. With rapid urbanization in Kenya, prioritizing efficient sewer system development and maintenance is vital for sustainable urban growth. Proper planning ensures new developments have adequate sanitation facilities and existing systems are upgraded to meet growing population needs.

Meru Town and the peri-urban area has an elaborate water supply system constructed in 2002 under a grant from the Government of Japan. The estimated population of the supply area is 118,000 people and about 57% of this population is served by this water supply system, while the rest access water services from existing community water projects. In addition, the town has a sewerage project recently constructed with a capacity to treat wastewater of 11,800m3 per day. It was funded by the African Development Bank and the Government of Kenya. The project commenced in the year 2018/2019 and was completed in 2023.

The phase 1 project has an elaborate network of trunk sewer lines of over 50Km ranging from DWC 600- 250DN various sections to a newly constructed sewer treatment plant in Rwanyange. These network traverses the town including Makutano, Milimani, Kinoru, Mwandantu, Gitimbine, Kaaga, Gikumene and Kirunga areas, among others. The main lines have been laid and there is need for tertiary connections and secondary lines to join the trunk sewers laid. It is this gap in the provision of adequate sewerage facilities, even as the water supply services have been improving over the years, that the Tana Water Works Development Agency proposes to close by investing in new sewerage facilities and networks to cover most of Meru Town and its environs.

The first phase of the project was completed with funding through a credit from the African Development Bank (ADB) under the Kenya Multi-Towns Sustainable Water Supply and Sanitation Program. The project was implemented by the Tana Water Works Development Agency (TWWDA) in collaboration with the beneficiary, Meru Water and Sewerage Services (MEWASS), and in consultation with various stakeholders including the County Government of Meru. TWWDA identified various water and sewerage projects within its area of jurisdiction to be undertaken under the National Urban Water Supply and Sanitation Program (NUWaSSaP) including the Last Mile Connectivity of the Meru Sewerage project. The implementation of the project is to be funded by the African Development Bank (AfDB) and the Government of Kenya (GoK).

1.2. Rationale of the ESIA

The Environmental and Social Operating Standards (E&S OSs) provided by the African Development Bank Group's Integrated Safeguards System 2013 delineate the responsibilities of Borrowers in identifying and assessing environmental and social risks associated with projects funded by the Bank. In addition, the Kenyan Environmental legislations particularly (EMCA 1999) and its subsidiary legislations legally mandates all development projects to undergo an Environmental and Social Impact Assessment during the planning stages. The assessment is critical for ensuring that significant impacts on both the biophysical and social environment are thoroughly evaluated throughout the project's life cycle, spanning its design, construction, operation, and eventual decommissioning. Compliance with these requirements is essential to uphold environmental and social standards and mitigate adverse effects on communities and ecosystems.

In pursuit of project funding and eventual implementation, TWWDA the project proponent engaged a team of experts to conduct an Environmental and Social Impact Assessment for the proposed project. This Project report serves as an essential precursor to secure funding and ensure the project's alignment with regulatory frameworks, encompassing both national and international legislative requirements. The ESIA was conducted in tandem with NEMA guidelines as well as adhering to the policies set forth by the potential project financiers (AfDB). The report gives project background details, as well as a thorough assessment of the anticipated environmental and social impacts associated with the development. Additionally, the report outlines a series of mitigation measures aimed at addressing and alleviating these impacts effectively.

1.3. Objectives of the ESIA

The main aim of the assignment was to identify the environmental and social impacts linked to the proposed last mile connectivity of the Meru Sewerage project and to provide suitable mitigation measures to be integrated into all stages of the project's cycle. This objective aligns with the overarching objective of safeguarding the environment in terms of social well-being, health, economic factors, and the physical condition of the area including soil, water, climate and biodiversity.

In brief, the specific objectives of the study were to:

- Identify all potential significant adverse environmental and social impacts of the proposed projects and recommend measures for mitigation.
- Verify compliance with the environmental regulations and industry's standards into planning, development, implementation and management of the projects.
- Generate baseline data for monitoring and evaluation of how well the mitigation measures will be implemented during the projects cycle.
- Recommend cost effective measures to be implemented to mitigate against the expected impacts.

- Conduct stakeholder participation in taking their views and the mitigation of adverse social impacts of the projects
- Prepare a comprehensive Environmental and Social Management Plan (ESMP) for the project
- Present results of the ESIA in such a way that they can guide in informed decision-making.
- Prepare an environmental Impact assessment report compliant to the Environmental management and Coordination Act CAP 387 and the AfDB Integrated Safeguards System detailing findings and recommendations

1.4. Data Collection Procedures and Methodology

The ESIA took an inclusive approach, considering various aspects such as environmental, social, cultural, economic, safety, and health impacts of the project. The adoption of the integrated approach identified and adequately addressed all the potential negative impacts. The exercise was carried out using the methodology described in EMCA, 1999 and Environmental (Impact Assessment and Audit) Regulations 2003, as well as international safeguard policies and standards. Given the nature and scale of the proposed project an Environmental Impact Assessment project report was prepared to ensure a thorough and comprehensive aspects of the ESIA were taken into consideration. The assessment methodology followed during the process was as follows:

1.4.1. Environmental Screening

Based on the amended 2nd schedule of the Environmental Management and Coordination Act (EMCA Cap 387), the Proposed last mile connectivity of the Meru Sewerage project is categorized as a Medium-Risk Project. The initial screening process indicated that the expected environmental issues associated with the project would be minimal.

Similar to any other project, the proposed development is anticipated to have specific impacts. However, these impacts are expected to be minor, and in cases where adverse effects may occur, a mitigation strategy will be implemented. Examples of such impacts include dust, noise, health, and safety concerns during both the construction and operational phases of the project. These impacts have been clearly identified during the screening stage and are detailed in the CPR report. The report also includes comprehensive mitigation measures that have been developed and described in the Environmental and Social Management Plan (ESMP).

1.4.2. Desktop Review

The desktop study encompassed a thorough review of various documents pertaining to the proposed activities, project specifications, and project layout. This review encompassed a wide range of materials, including policy and legislative frameworks, as well as an analysis of the environmental context of the area. The key documents examined during this process included the following: AfDB Integrated Safeguards System 2013, Kenya's policies, strategies, and guidelines; relevant national and county laws

and regulations, Literature regarding water Infrastructure and, where applicable, Multilateral Environmental Agreements (MEAs).

1.4.3. Physical Inspection of the Site and Surrounding

Physical inspection of the proposed site which included field investigation at site and surrounding areas was done in on between 26th, February and 8th, March 2024. The field investigation aimed to visually examine the site's characteristics and evaluate the suitability of the sites to the proposed projects. Evaluation of the existing environmental conditions in the vicinity. The purpose of this inspection was to determine the potential impacts that the project may have on the environment and the community as well.

1.4.4. Public Participation

As part of the ESIA process, public participation was facilitated through public baraza, questionnaires, as well as interviews with key stakeholders and informants. The information gathered through these questionnaires was carefully analysed and integrated into the ESIA Summary Project Report.

Public participation meetings were organized with the aim of engaging the beneficiaries, Project Affected Persons (PAP's) and the adjacent communities of the proposed last mile connectivity of Meru Sewerage Project. The series of meetings were as in the table below.

Table 1-1: Public meetings organisation

Date	Venue	Interested Persons	Attendance
28th February 2024	DCC's Boardroom Meru	Community and the Public Administration	18 (8M, 10F)
29th February 2024	Meru Municipal Hall	Community and PAP's	40 (18M, 22F)
29th February 2024		Community	
7th March 2024	Kinoru Stadium Hall	Municipality Business Community and the community	78 (53M, 25F)

(Please refer to the attendance list in Appendix 2, and the detailed record of the public consultation meeting in Appendix 1). The primary objective of the public consultative meeting was to integrate the concerns and perspectives of all individuals within the project's vicinity, acknowledging the vital role the community play in shaping the project's success.

To deepen the project's comprehension of the circumstances, a sequence of key informant interviews and consultations was undertaken. These engagements, expounded upon in Chapter 6 of the project documentation, were strategically conducted to gather the insights and standpoints of pivotal stakeholders deeply involved in the project's consequences. This approach facilitated the understanding of various viewpoints, contributing to a well-rounded perspective on the matter.

In addition, a total of 40 questionnaires were distributed to systematically capture the concerns and viewpoints of individuals residing within the project's immediate surroundings. This method ensured that a diverse range of perspectives were incorporated, aiding in the development of a comprehensive understanding of the community's needs and expectations

1.5. Data Analysis, Documentation and Report Structure

The Environmental Impact Assessment report was prepared based on the findings in adherence to the ESIA guidelines provided by the AfDB Integrated Safeguards System 2023 and National Environment Management Authority (NEMA) guidelines for the preparation of a Comprehensive Project Report. Throughout the process, the Consultants maintained regular communication and provided updates to the project proponent.

The ultimate outcome of the assessment process is the production and documentation of this Comprehensive Project Report, which is specifically designed to ensure that the proposed development aligns with the requirements of the Environmental Management and Coordination Act (EMCA, Cap 387). The report is structured into chapters, which are outlined as follows:

- Chapter 1: Introduction: Gives Background Information to the Study Describing the Objectives and the Terms of Reference.
- Chapter 2: Nature of the project: Description of Project
- Chapter 3: Location of the project: Outlines the Location of the Study Area.
- Chapter 4: Baseline Environmental Conditions
- Chapter 5: Policy, Legal and Institutional Framework
- Chapter 6: Public Participation and Stakeholder Consultation:
- Chapter 7: Analysis of the Proposed Project Alternatives
- Chapter 8: Anticipated Impacts and Mitigation Measures
- Chapter 9: Environmental and Social Management & Monitoring Plan (ESM&MP)
- Chapter 10: Conclusion and Recommendation:
- References
- Appendices

2. PROJECT DESCRIPTION

2.1. Existing Sewerage Infrastructure

The town has a sewerage project that was recently constructed with a capacity to treat 11,800m3 of wastewater per day. It was funded by the African Development Bank and the Government of Kenya from the year financial 2018/2019 and was completed in 2023. The project has an elaborate network of trunk sewer lines of over 50Km ranging from DWC 600- 250DN various sections to a newly constructed Waste Water Treatment Plant in Rwanyange. These network traverses the town including Makutano, Milimani, Kinoru, Mwandantu, Gitimbine, Kaaga, Gikumene and Kirunga areas, among others. The main lines have been laid and there is need for tertiary connections and secondary lines to join the trunk sewers laid for the residents within the Municipality to utilise the system. This calls for the proposed Last Mile Connectivity of the Meru Sewer Project.

2.2. Design

The proposed project Design Criteria and Standards were prepared for adoption in the design of the various elements of the project in line with the Kenyan Waste water design guidelines and best international practices. The design criteria cover, but is not limited to, the planning horizon, population projections, selection and sizing of sewer lines. The design guiding principles for the proposed project include:

- The trunk sewers are realigned as much as is practical to avoid interfering with existing private properties and developments;
- The trunk sewers are realigned to follow the valleys as applicable;
- The design of sewers will aim at optimizing the pipe gradients in order to minimize the earthworks.

2.2.1. Design for Sewerage Conveyance System

The proposed project shall use a minimum diameter size of 230 mm for sewers in their parameters for Adoptive Standards (2). In order to reduce the tendency of blockages, the project have adopted a minimum of 300 mm in its trunk sewers. It is proposed to adopt a similar standard for this particular project.

Table 2-1: Minimum size of sewers

No of House Connections	Diameter
Individual connections	150 mm
Up to 5 house connections	150mm
Greater than 5 connections	200mm
5 to 10 Connections	250mm

2.2.2. Depth of sewers

The minimum depth of sewers at the starting points will be maintained at 900mm and 400mm at other locations. However, minimum and maximum depths of sewers are dictated by the actual ground conditions on site and economic considerations. The following protection criteria generally apply in the design:

Table 2-2 Depth of sewers & Protection criteria

	Depth range in mm	Pipe protection
In Open fields	400-600	Concrete bed and surround
	600-750	Concrete bed and haunch
	Over 750	Protection governed by factors other than shallowness 100mm concrete bed to be used when founding on rock
In roads	600-750	Concrete bed and surround
	750-1200	Concrete bed and haunch
	Over 1200	Protection indicated by factors other than shallowness. i.e., Type C/Type D as provided in the drawings

The above-mentioned pipe protection criteria should however be checked with structural stability conditions of pipes using the Marston equation and proper measures recommended.

2.2.3. Pipe material

The following pipe materials are manufactured in Kenya:

- Precast concrete pipes
- uPVC pipes
- Steel pipes

According to the Design report prepared by the Client, uPVC and concrete pipes are recommended for trunk sewers. However, the use of concrete pipes for trunk sewers is recommended due to their strength and durability. uPVC pipes are recommended for the laterals and reticulation sewers.

2.2.4. Hydraulic design

Sewers flowing part-full

For circular conduits flowing part-full, the Colebrook-White equation has long been regarded as the one that most closely relates both pipeline theory and observed pipeline losses. The velocity has to be calculated using a re-arranged form of the Colebrook-White equation

The Manning's equation was used for flows through box culvert sewers and channels. $v = 1 / n \, R^{2/3} \, S^{1/2}$ (1)

Where
v = cross-sectional average velocity (m/s)
A = cross sectional area of flow (m^2)
n = Manning coefficient of roughness R
= hydraulic radius (m)
S = slope of pipe (m/m)

Hydraulic radius can be expressed as

$R = A / P$ (2)

Where
A = cross sectional area of flow (m^2) P = wetted
perimeter (m)
The flow in the channel can then be calculated as $q = A\ v = A\ k_n$

$/\ n\ R^{2/3}\ S^{1/2}$ (3)

Where
q = volume of flow (m^3/s)
A = cross-sectional area of flow (m^2)

Friction factor

In theory, the roughness of pipes is related to the height of the roughness elements of the pipe wall. In practice it is also influenced by other factors, which includes the straightness of the pipe, number of connections, jointing etc. However, for sewers it is primarily dependent on the extent of slime

growth on the pipe surface. BS 8005, 1987 gives the following recommendations for new sewers which are free from deposits.

Table 2-3: Frictional factors for the project

Surface Water Sewers Material	**BS 8005 Recommended roughness factor K**
Well pointed brickwork	1.5 mm
Spun concrete pipes	0.25 mm
Precast concrete pipes	0.30 mm
Clay with spigot and socket joints	0.06 mm
uPVC	0.03 mm
Foul water sewers	
Peak DWF between 0.76 m/s and 1.0 m/s (Where peak DWF = DWF diurnal maximum)	1.5 mm

The engineering team recommended a friction factor for foul concrete sewers as 1.5 mm.

Minimum velocities and pipeline gradients

The minimum gradients for foul sewers shall be such as to produce velocities sufficiently high to ensure that the pipes are self-cleansing. BS 8005 states that all sewers shall be laid at sufficient gradient which will give a minimum velocity of 0.75 m/s occurring sufficiently frequently, and that this is usually achieved by laying sewers at gradients that will give a velocity of 1.0 m/s at full bore flow.

The Parameters for Adoptive Standards (2) recommends that velocities should exceed 0.75 m/s in pipes when flowing full at peak flow conditions.

A velocity of 1.0 m/s, however is often considered necessary in tropical climates to avoid the build-up of hydrogen sulphide in sewers, which causes odour and corrosion problems. This requirement is more important for trunk sewers, and is not appropriate for house connections and secondary sewers where flows may be intermittent and retention times short.

For larger sized sewers, it is recommended that full bore velocity of 1.0m/s as shown below be maintained in order to avoid septicity. The recommended gradients for various pipe sizes are shown in the following table:

Minimum gradients calculated for Ks=1.5mm:

Table 2-4: Minimum Pipe Gradients

Diameter (mm)	Minimum Gradients for Full-bore V=			Recommended Gradient (For smaller diameters)	Recommended Gradient (For larger diameters)
	1.0m/s	0.87m/s	0.75m/s		
	1 in:	1 in:	1 in:	1 in:	
150	77	100	135	100	
225	130	175	235	175	
250	150	200	270	200	
300	190	250	340	250	
350	235	300	415	300	
400	280	370	495	370	
450	325	425	575	400	
500	370	490	660	450	
600	470	620	830		470
750	620	820	1100		620
900	860	1140	1500		860

It is important to note that the gradients are largely dictated by practical ground conditions, A maximum velocity of 4m/s is recommended to avoid abrasion of the sewer pipes.

2.2.5. Manholes

Location and spacing

Manholes shall be constructed at every change of alignment, of gradient, at the head of sewers or branches, at every junction of two or more sewers and wherever there is a change in the size of sewers. The recommendations for minimum manhole spacing and wayleaves are given below

Table 2-5: Recommended Manhole spacing

Sewer Size		**Manhole Spacing**	**Min. Manhole Dia.**	**Construction Wayleave**	**Permanent Wayleave**
From	To				
mm	mm	m	mm	m	m

230	375	60	1050	4	3
450	610	80	1200	5	4.5
635	900	100	1500	6	6.0

Manholes shall be constructed of locally manufactured bricks where the sewers are shallow (up to 600mm depth) but preference will be given to cast in situ or precast concrete manholes. Precast concrete manholes/slab covers shall be adopted in order to discourage theft or vandalism.

In areas with heavy traffic, heavy-duty cast-iron manhole covers could be used, while medium duty manhole covers and frames or equivalent could be used in areas with limited traffic access. Manhole covers are to be imbedded in road bitumen after final inspection if required.

The minimum height from the soffit of the pipe to bottom of the roof slab shall be maintained at 2m in order to provide comfortable space for the maintenance purposes.

Benching

An area of benching shall be so provided in each manhole as to permit a man to stand easily, comfortably and without danger to himself, on such benching while working in the manhole. The manhole benching is designed at a grade not steeper than 1 in 5 or flatter than 1 in 25 and will be battered back equally from each-side of the manhole channels.

2.2.6. Structural design of sewers and pipes

The maximum and minimum trench depths for sewers of various materials is calculated using the methods given in National Annex (NA) to BS EN 1295-1:1998. Appropriate materials for the intended depth of installation are considered.

The computation of loads on buried pipelines has been established by the work of Marston, Spangler and others, and is summarized by the Simplified Tables of External Loads on Buried Pipelines, (10), which will be adopted for this Project.

The trench bottom shall be smooth and free from all stones and other projections, in order to give the pipe an even support for the entire length. Where this is not possible, and in rock, a minimum depth of 100mm of granular material shall be provided as bedding under pipes, shall be placed between the pipes and the trench sides and brought up in 200 mm compacted layers to at least 150mm above the crown of the pipe. Where the depth of cover to pipes is low, concrete bedding, haunch and surround shall be provided. a minimum diameter of 300 mm diameter for the trunk sewers and a maximum of 675 mm diameter at the Outfall sewer piping's shall be adopted for the project.

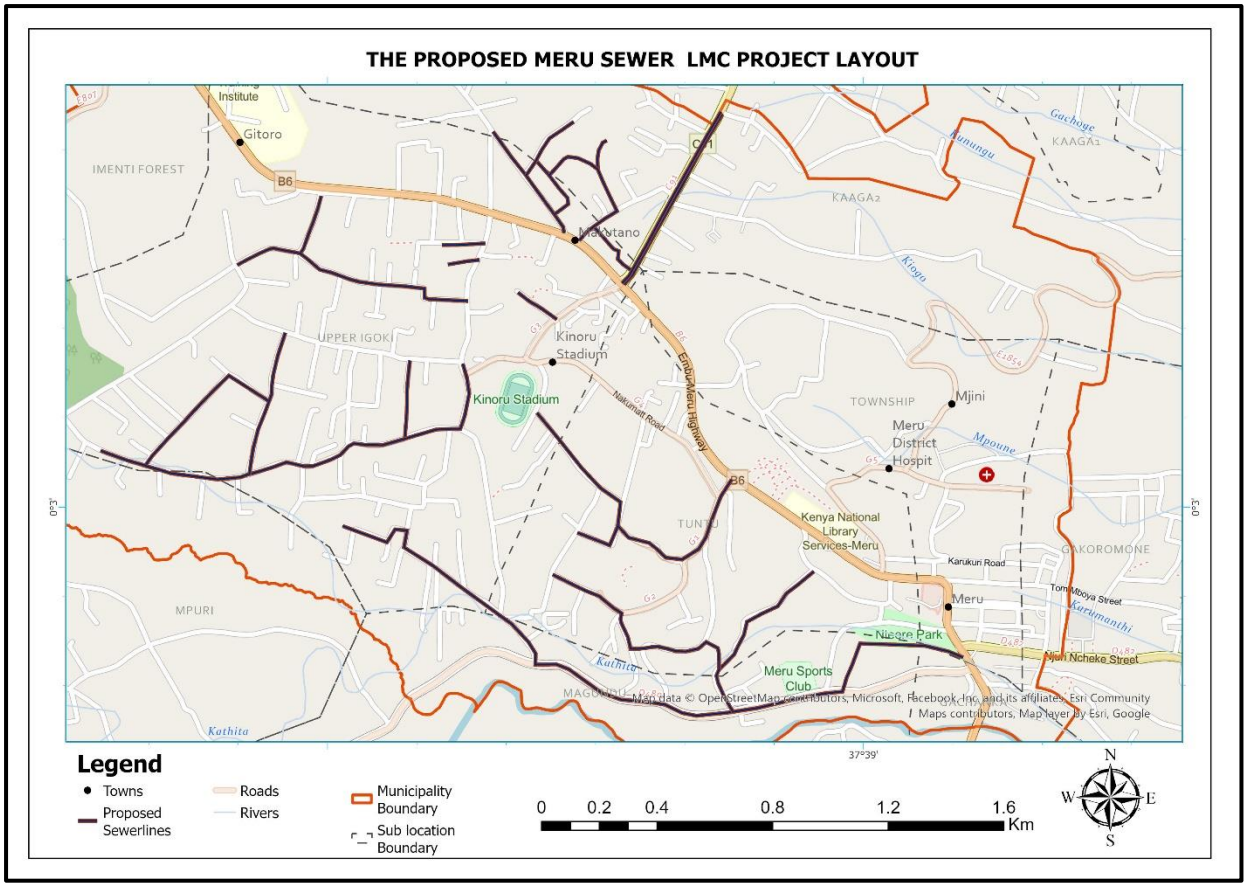


Figure 2-1: Proposed Meru Sewer LMC Layout

Table 2-6: Sewage collection and conveyance system pipe sizes and lengths

Trunk	Pipe Dia (mm)	Length (Km)	Last mile Connections	Pipe Dia (mm)	Length (Km)
EXISTING TRUNK LINES			***PROPOSED LASTMILE LINES***		
Kemu Trunk	300	3.3			
Kombokie Secondary Trunk	300	5.1	Kambokie line (TS3)	250	5.4
Kombokie River Trunk	300	5.6	Kambokie Line (TS1)	250	3.0
	375	3.3		300	1.4
Kaaga Trunk	300	2.2			
Gachoge River Trunk	300	5.5			
	450	4.0	Gachoge line (TS4)	250	3.7
Kununga River Trunk	300	3.0			
MTTC-Mpuone Trunk	300	5.6			
Kiogo River Trunk	300	5.2			
	450	2.1			
	500	2.5	Kiogo Line (TS2)	250	4.0
	675	1.2		300	3.0
Karumanthi Trunk	300	4.6			
Gikumene Trunk	300	2.5	Gikumene line (TS5)	250	6.0
Kathita River Sewer	300	9.8			

	375	1			
Total		**56.2**			**26.5Km**

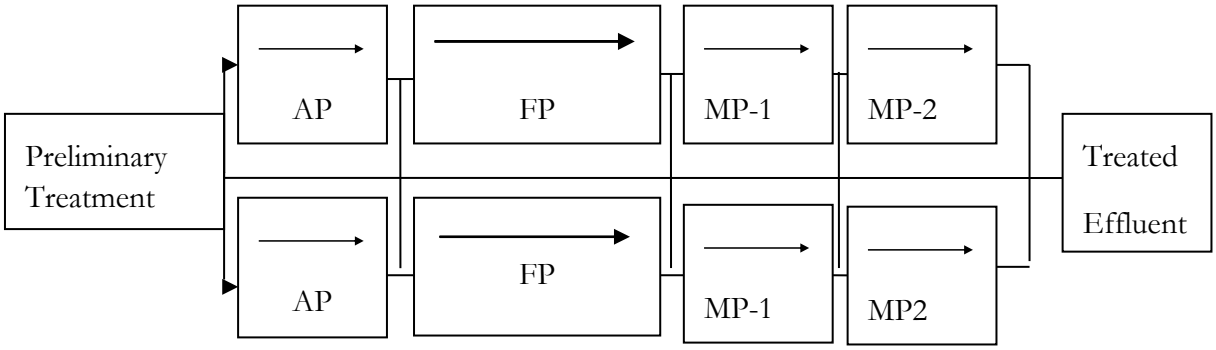
2.3. Sludge Management and Disposal

The town has a sewerage project recently constructed with a capacity to treat wastewater of 11,800m^3 per day. It was funded by the African Development Bank and the Government of Kenya. The project commenced in the year 2018/2019 and was completed in 2023. The LMC Project for Meru Sewerage Project shall be linked up to the current sewerage system with a Waste Water Treatment Plant in Rwanyange in Meru. The design specifications for the treatment plant is as described.

The sewage treatment works was designed for the future year (2030) design flow.

The sewage treatment process consists of preliminary treatment and waste water Stabilisation ponds consisting of anaerobic, facultative and maturation ponds as shown in the schematic representation below.

Figure 2-2: Schematic Drawing of the Sewage Treatment Works



2.3.1. Preliminary Treatment

The preliminary treatment works consist of screens, grit chambers, parshal flumes, over flow chamber and flow distribution chambers. The works have been designed to have two parallel systems of equal capacity for ease of maintenance.

I.Screens

Manually raked screens which consist of coarse and fine screens, have been provided in the design.

Coarse Screens: These consist of 25mm diameter bars placed at 60^0 to the vertical at a clear spacing of 50 mm. The vertical inclination gives increased surface area of contact with the sewage and eases the cleaning by the use of a hand-held rake.

Fine Screens: These consist of 6 mm diameter bars placed at 60^0 to the vertical at a clear spacing of 25 mm. The Screens are located in the inlet chambers (2No) with dimensions 8.5 m long, 2 m wide and1 m depth with a design approach velocity of 0.75 m/s.

II.Grit Removal Channel and Parshall Flume

Two constant velocity rectangular grit channels have been proposed for grit removal. The grit channels are each designed to accommodate the design flow capacity. The dimensions of the channel for the Ultimate year design flow are as shown below;

- Length= 8.5 m.
- Width= 2 m.
- Depth= 0.8 m

The Parshall flumes have been provided immediately downstream of the grit removal channel to enable flow measurements and to assist in ensuring constant velocity in the grit chambers.

III.Overflow Chamber.

An overflow chamber was designed with a weir that connects to a pipe and drain at the sewage treatment works outfall to the river.

IV.Flow Distribution Channels.

The flow distribution channels have been designed to distribute the flows to the 2 parallel waste water stabilisation ponds systems. Sluice gates were provided to control the flow and an emergency by-pass to outfall of the sewage treatment works.

2.3.2. Anaerobic Ponds

The WSTP has two Anaerobic ponds in parallel, they were designed for a depth of 4.5m, a retention time of 1 day with a volumetric flow of 350 g/m^3-day. The area covered by each of the anaerobic ponds is 1297 m^2.

2.3.3. Facultative Ponds

The WSTP has two Facultative ponds for the two parallel waste water stabilisation ponds systems. They were designed for a depth of 1.5m, a retention time of 4.5 days and a surface loading of 350 kg/ha-day. The coverage area for each pond is 17,508 m^2. The design calculations for the facultative ponds are as shown in appendix 2.

2.3.4. Maturation Ponds

The WSTP has four maturation ponds for two for each parallel waste water stabilisation ponds system. A depth of 1m has been adopted for the ponds with a retention time of 3.4 days. In each series the first maturation pond covers 18,961 m^2 and the second maturation pond covers an area of 18,585 m^2

2.3.5. Effluent Outlet Works.

The effluent from the WSTP is being drained into the near Gachioma River to be used for irrigation purposes downstream.

2.3.6. Sludge Drying Beds

The WSTP has open air sludge drying beds with an under-drainage system with an area of .0.17 ha.

2.4. Proposed Project Activities

The activities related to the proposed project have been classified into four distinct phases of project implementation, which are the planning phase, construction phase, operation phase, and decommissioning phase. Each of these phases has its specific set of activities and considerations, which will be discussed in detail in the following subsections of the report.

2.4.1. Pre-construction Phase Activities

The main activities during pre-construction phase include resource mobilization, conducting specific studies i.e., feasibility studies, ESIA and RAP, acquisition of necessary permits, tendering services, site handover, handover of drawing and water work plans and site layout to the contractor.

2.4.2. Construction Phase Activities

The construction phase entails the following activities:

1. **Site Preparation**:

- Clearing the construction site of any obstacles, debris, or vegetation.
- Excavating trenches for laying sewer pipes and installing other infrastructure.

2. **Sewer Line Installation**:

- Excavating trenches according to the approved design specifications.
- Laying sewer pipes carefully, ensuring proper alignment, slope, and joint connections.
- Backfilling the trenches with suitable material and compacting it to provide support and stability to the sewer pipes.

3. **Manhole and Access Point Installation**:

- Constructing manholes and access points at regular intervals along the sewer line for maintenance and inspection purposes.
- Installing frames, covers, and other appurtenances to secure and protect access points.

During this phase, the selected contractor will maintain all access to the sites and provide temporary screens, fencing, hoardings, fans, planking footways, as may be necessary for protecting the public and others. Ramped and Covered Walkways are also proposed.

4. **Machinery and equipment**

During the construction of the sewerage pipeline, a variety of machinery and equipment will be required to ensure efficient construction, operation, and maintenance. Some of these machinery and equipment include:

- Dozer
- Poker vibrator
- Concrete mixer
- Excavator
- Backhoes
- Truck/Tipper
- Plain Roller
- Modern Survey Equipment
- Fusion Machines for HDPE Pipes
- Welding Machines

5. Waste Management

Waste materials will be generated by the construction and, to a much lesser extent, operation of the Project. This will include both non-hazardous and hazardous wastes. A preliminary review of existing waste management facilities has been undertaken to determine the ability of existing waste management facilities to handle waste generated by the Project. This information will be updated and developed in more detail as part of the Engineering Procurement and Construction (EPC) process.

a. Construction Waste

Construction waste will be generated from a range of activities including:

- Preparation and transportation of pipe and other equipment and facilities.
- Clearance of vegetation within pipeline Right of way.
- Pipeline installation through cut and fill trenching.
- Pipeline welding and finishing.
- Pre-commissioning and commissioning, including hydro-testing.
- Construction camps for pipeline workers; and Offices and other facilities.

b. Earthworks Waste

Over most of the length of the pipeline, 100% of the excavated material will be returned to the trench. Padders will be used on the construction spreads which will allow the

excavated material to be used as backfill material, around the pipe and cables, by separating out larger stones from the excavated material.

There is only a small amount of residual spoil (per linear metre) when the trench is completely backfilled and this can be spread across the Right of way when completing the reinstatement and restoration, without any impact. There is no need to remove spoil from site for disposal elsewhere.

In rocky areas, there may be insufficient fine material for backfill and material will need to be imported. This will result in some wasted excavated material; however, volumes are still likely to be relatively small. In rock, the excavation depth and cover to the top of the pipe will be reduced to as low as 0.6 m and the trench sides will be vertical.

In a trench with vertical sides, the volume of backfill required is minimised. The volume of backfill and hence the volume of residual spoil for a vertical trench is approximately 0.8 m^3 per linear metre of trench, whilst for a battered trench, the volume is more than double. Pipeline trenches with battered sides will be required in some areas, however the overall percentage will be very low, and any additional material will be mixed and spread across the Right of way following the same method as above.

c. Metal Waste

For pipeline waste, it has been assumed that 0.3% - 0.5% of the pipeline will be metal waste (from off-cuts, damaged sections etc.). In addition, there will be welding rod (electrode) waste of approximately 10% - 20% of the weight of each rod. All metal waste will be stored at the main construction camps, weighed and accounted for prior to disposal. This waste (scrap) will attract a market value and all receipts reconciled at the end of construction.

d. General Solid Waste

This comprises waste generated by accommodation camps, offices, and storage facilities, and includes paper, plastics, non-recyclable materials, food waste and other non-hazardous waste materials. General construction waste volumes will be generated from field joint coating materials and packaging, line pipe end caps/bevel protectors, cable drums and pallets. Some of the materials generated, such as waste epoxy and waste PUF, will need to be segregated and handled separately. Some of the packaging materials will also be contaminated and need to be managed as hazardous waste. It should be noted that items such as the cable drums and pallets could be reused by local communities for firewood or

building materials. An assessment of such opportunities will be undertaken during detailed design.

e. Wastewater

Wastewater volumes can be calculated for sanitary wastewater based on 100 ltr/person/day for sewage and 200 ltr/person/day for grey water. Depending on the location of the mobilization area, the generated wastewater will be disposed of using the available technology i.e. through an existing sewer system, septic systems or biodigester system or any other onsite treatment system.

f. Hazardous Waste

Hazardous waste will include waste oils and filters from mobile plants and equipment and generators, oily rags, waste solvents, used chemical drums, used lubricants, paint waste and hot insulation waste (both used for tanks, vessels and piping at stations). The main process that generates waste apart from welding during the construction phase is the field joint coating.

All hazardous wastes will be stored at the worksite in segregated areas with an impermeable base and roofing to prevent contamination of run-off. Hazardous wastes will be collected regularly and taken for disposal appropriately to a licensed waste management facility.

Waste Management Strategy

The Project Waste Management Strategy is based on the waste management hierarchy which outlines a preferred order from waste management i.e. prevention, re-use, recycling and recovery and disposal as a last resort. This approach aims at promoting environmentally friendly practices, efficient resource use and reduced pollution and negative impacts to the environment.

The anticipated waste streams have been evaluated against the requirements of the Environmental Management and Coordination (Waste Management) Regulations 2006 and the disposal methods and options have been identified in this ESIA Report. Where a waste disposal facility/landfill is not present within proximity of significant waste generator locations (e.g., main accommodation camps), or of sufficient size to handle to additional quantity, waste will be transported and managed within the WSP waste management

facilities. The potential impacts associated with waste management have been described and appropriate mitigation approaches defined in section 6.5 of this report.

Construction & Operations Workforce

Indicative workforce projections have been estimated from the design analysis. The EPC Contractor will prepare a more detailed workforce numbers and workforce management plans based on the commitments set out in this ESIA report. The construction workforce will comprise approximately 200 personnel. Construction jobs will comprise:

- Management – Site Resident Engineer, Supervisor, Foreman, Site Planner.
- Skilled – Quantity Surveyor, Safety Health and Environment Consultant, Welder, Site Operators
- Semi-Skilled – Electrician, Mechanic, First Aider
- Unskilled – General Labourer, Guards, Drivers

Depending on the activities at campsites, and materials stored at the place, the campsite might have low, medium to high impacts on social and natural environment of the area that needs proper assessment and mitigation measure put in place. The campsites will be decommissioned after construction phase of the project is completed.

2.4.3. Operation Phase Activities

Upon completion of the construction phase, the sewerage system in Meru will stand ready to provide reliable sanitation infrastructure. The management and operation of the newly constructed sewerage treatment and system will be entrusted to the Meru Water and Sewerage Services, in accordance with the provisions of the Water Act 2016 and the policies set forth by WASREB. Continuous monitoring of the sewer system's functionality will be undertaken to ensure its conformity with local, national, and international environmental sustainability standards and best practices. Regular assessments and scientific tests will be undertaken to ascertain that the structure continues to meet the requisite standards and effectively serves its designated purpose. Furthermore, these periodic evaluations will guarantee that the sewer system remain in sync with the most current developments and advancements in sanitation infrastructure technology.

2.4.4. Decommissioning Phase Activities

The decommissioning of the sewerage system may be required under certain circumstances, such as a change in project goals, changes in climatic conditions, or a shift in government policies related to land and water use. In such cases, a Decommissioning Plan shall be prepared to guide the process the structures that are affected will be demolished. Non-reusable materials from the demolition process will be sold to licensed scrap metal dealers.

During the closure of the project, all activities will be halted, and the built structures and fences will be demolished. The affected land will undergo landscaping efforts, including the planting of appropriate indigenous trees and grass, to restore its natural state.

2.5. Project Cost and Implementation Schedule

According to the bills of quantity (BOQ) derived from the technical design of the project, the estimated cost of implementing the project, including auxiliary infrastructure (excluding the cost of the Environmental and Social Management & Monitoring Plan), is approximately Ksh **245,809,520.44** on implementation.

3. BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS

3.1. Project Location

The proposed Last Mile Connectivity of the Meru sewerage project shall cover the Municipality in Meru tow in Meru County. The county is located at the east of Mt. Kenya, whose peak cuts through the outskirt of its southern boundary. The county has a total area of 6,936.2 Km^2 out of which 972.3Km^2 is gazetted forest. The county borders five counties; to the North, it borders Isiolo County, to the East Tharaka/Nithi County, to the South West Nyeri County and to the West Laikipia County.

The Project Area is located in the proximity of 00 2' 40"N Latitude and 370 39' 17"E longitude lines. It is within Meru Town serving as the administrative town for the County Government. Meru. The town is approximately 28 Km off the A2 Nairobi-Addis Ababa trunk road and approximately 275 km North-East of Nairobi town the Capital City of Kenya. Major roads traversing through the town are Meru- Nairobi, Meru Maua, Meru-Nkubu and Meru Mitunguu Road.

Meru Municipality is located in Imenti North Constituency and it is administratively divided into fourteen sub-locations namely Meru Township, Kaaga Murathankari, Kaaga Municipality, Lower and Upper Igoki, Tuntu, Mugundu,Gachanka, Gakoromone, Runogone, Njoke, Chungari, Muringa, and Nchaure. It is further divided into five wards namely Naari, Kaaga, Chugo, Thura and Giaki. The map below and Satellite imagery gives a detailed description of the project location.

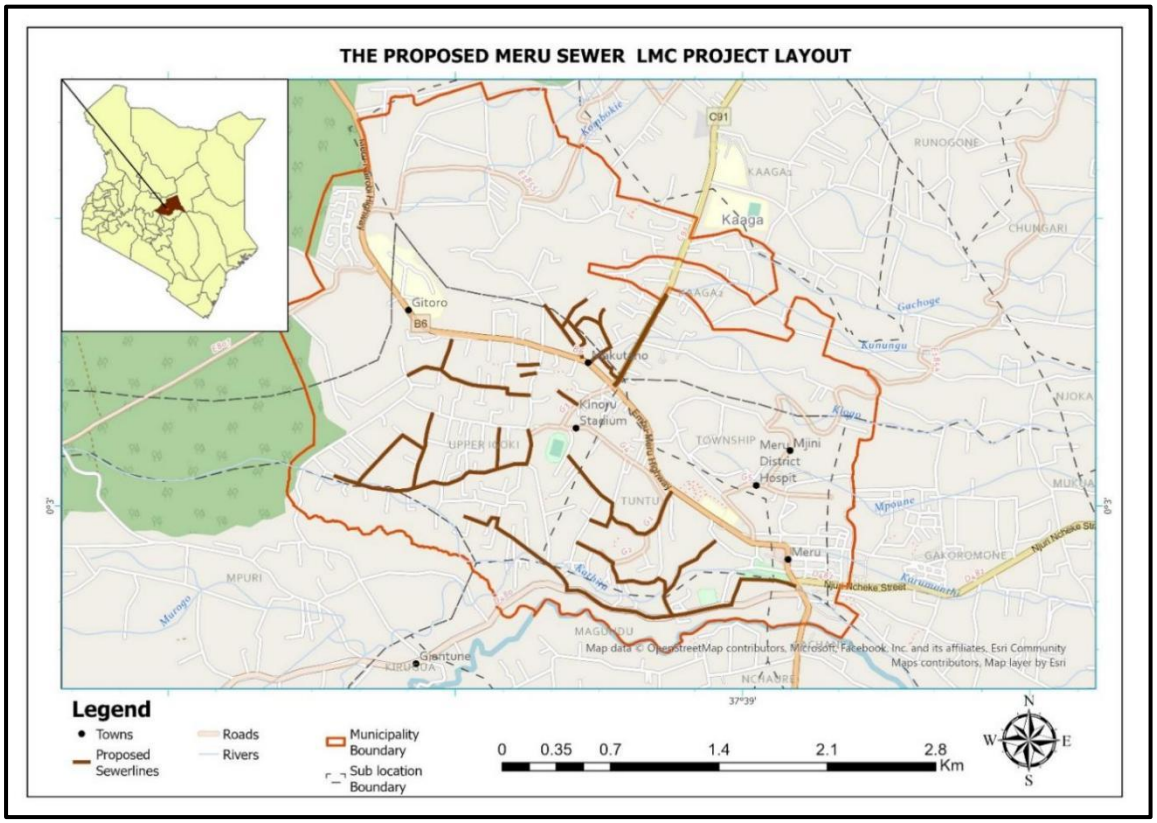


Figure 3-1: Location of the proposed LMC Meru Sewerage Project

3.2. Biophysical Environment

3.2.1. Topography

The physiographic conditions of the county are significantly influenced by its position on the eastern slopes of Mt Kenya and the equator. Altitude ranges from 300m to 5,199m above sea level at the peak of the mountain. The drainage pattern in the county is characterized by rivers and streams originating from catchment areas such as Mt. Kenya and Nyambene ranges in the North. The rivers cut through the hilly terrain on the upper zones to the lower zones and drain into the Tana and Uaso-Nyiro Rivers which form the main source of water for both domestic and agricultural use.

The Altitude range for the project area is 1799 m.a.s. l, on the upper reaches of Kathita River neighbouring Mt Kenya Forest whilst the lowest elevation is 1265m.a.s. l at the proposed Sewage Treatment Works site in Thuura location next to Kinyarita River. To the North of the Town CBD towards Kaaga and the Municipality area, it is characterized by gentle sloping topography

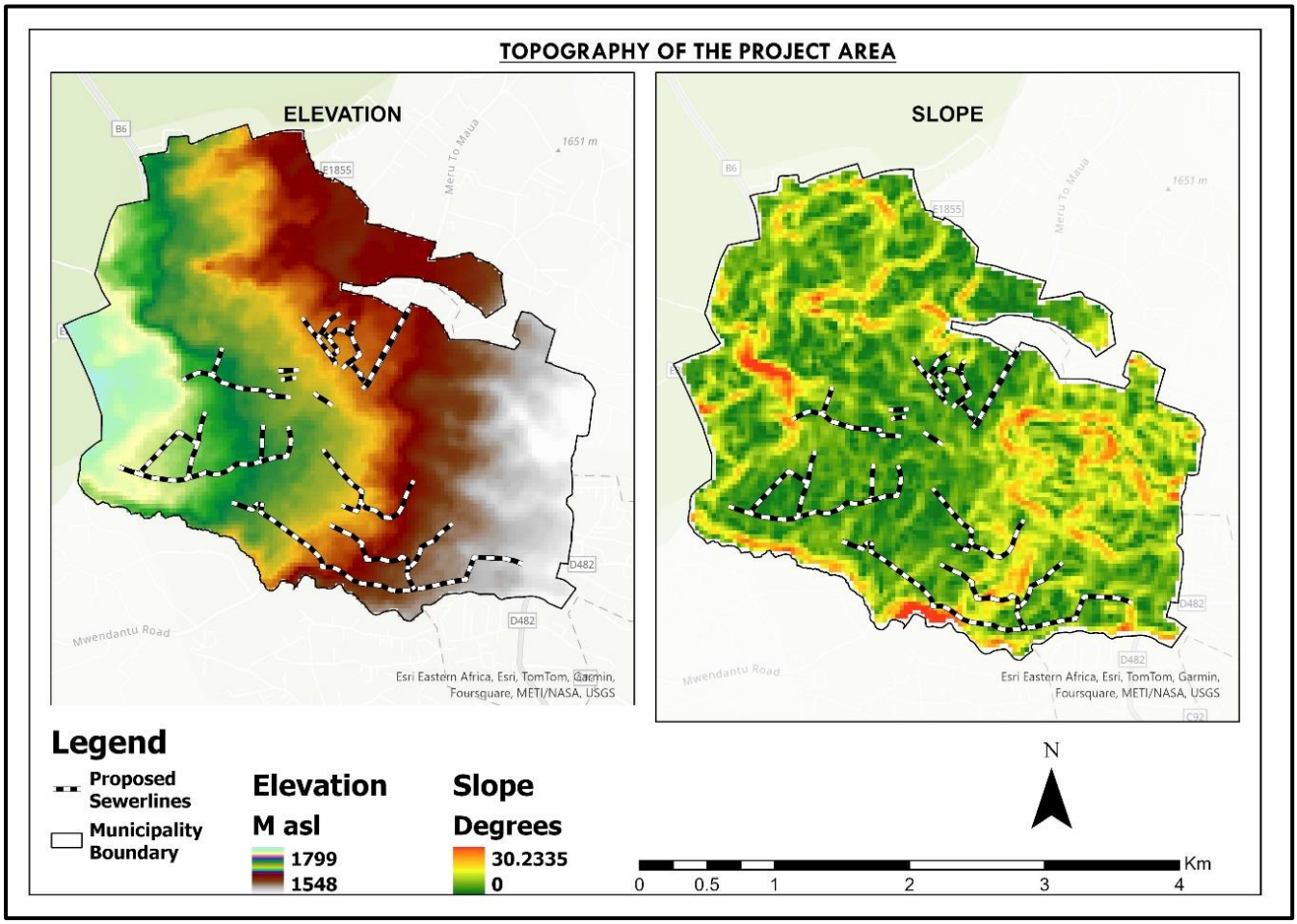


Figure 3-2: The topography of the Project area

3.2.2. Hydrology

The drainage pattern in the county is characterized by rivers and streams originating from catchment areas such as Mt. Kenya and Nyambene ranges which are the main water catchments areas for the county. The Project area is located on the North East of Mt Kenya and lies within the Kathita River drainage area (4FA). It is characterized by steep slopes with a mixed parallel and radial drainage pattern in the upper reaches consisting of short spans of ridges and deep gorges that run almost parallel to each other within close proximity but with a general dendritic pattern on the lower reaches. The rivers courses within the municipality area include Mpoune, Kiogo, Karumanthi, kunungu and Gachoge, Gachioma, Lueye Kang'iri, Kiguri, Murogo, Kombokie and Kanyuanga which all drain to the Kathita river.

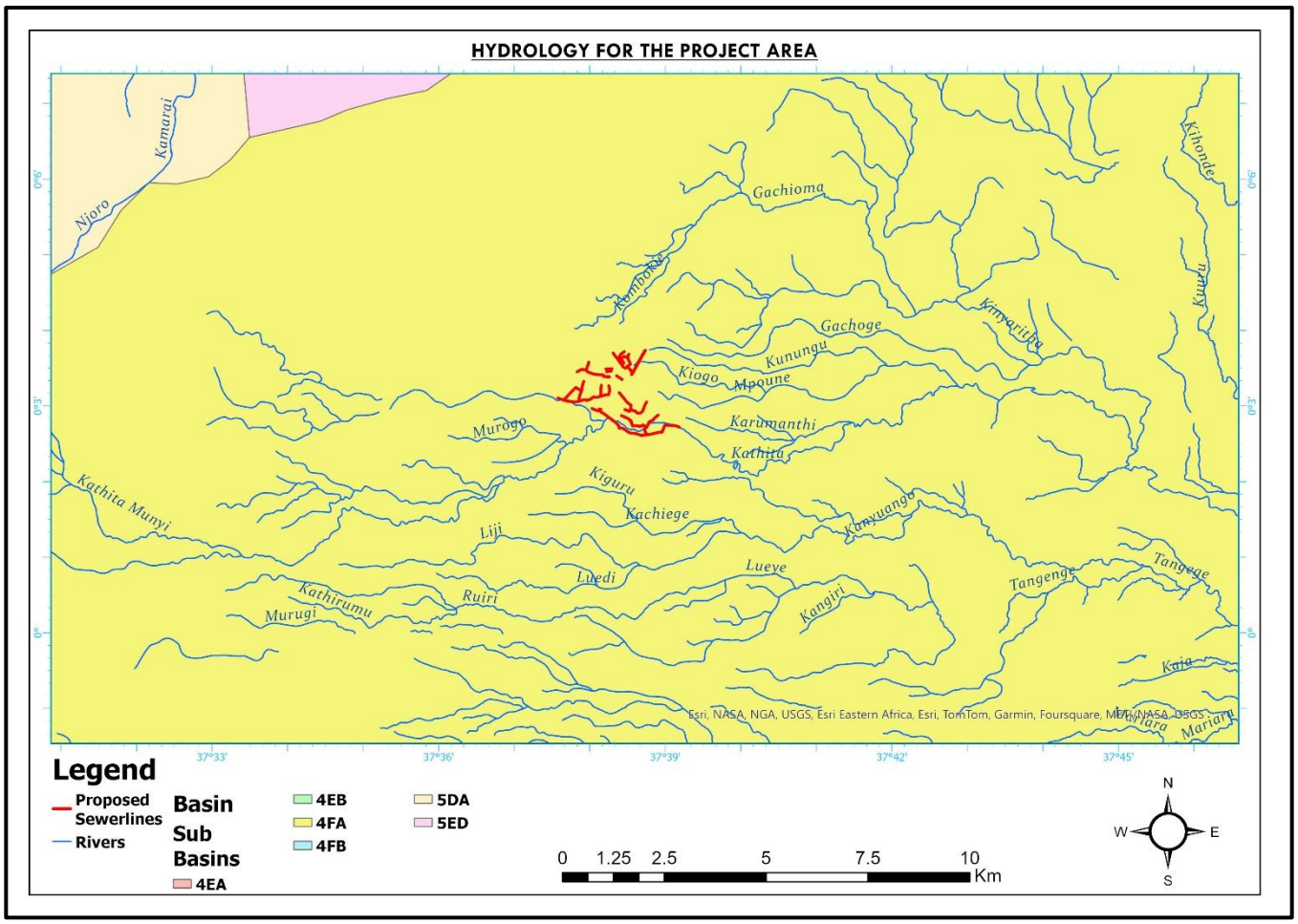


Figure 3-3: Hydrology Map for the project area

Figure 3-4: Section of the Kathita river which forms the main river in the locality

3.2.3. Geology and Soils

The geographical region is predominantly characterized by the presence of rocks from the Basement Complex. The rocks consist of undifferentiated quartz and is covered by a layer of Kenya Basalt. These rocks consist mainly of metamorphosed and granitized formations with origins in sedimentary and volcanic processes. Among these formations, migmatites, granitoid gneisses, and paragneiss's are prevalent. These rock types are arranged in consistent belts, which is a common feature in the surrounding vicinity.

The soil structure comprises mainly of volcanic soils, which are dark reddish brown, well drained, friable and very calcareous and derived from tertiary volcanic rocks. These are suitable for agricultural development. Notably, are patches of black clay loamy soils characterized by the prevalence of sandy soils resulting from the decomposition of indistinct Basement rocks.

3.2.4. Biodiversity

The municipality area falls in the midland areas characterized by shrubs and patches of forests both planted and natural. Most of the lands have been developed to residential and commercial purposes however the undeveloped lands are still being utilised for agriculture. The municipality covers some parts of Meru and Imenti forests which forms part of the great Mt Kenya forest ecosystem. The forest surrounding serves as a crucial habitat for a diverse array of flora and fauna. With 880 plant species, including 11 endemic and 150 near-endemic varieties, it stands as a testament to the richness of afro-alpine flora in the region (Mount Kenya National Park Natural Forest - 2020 COA - en n.d.). This biodiversity extends to avian species as well, with 53 out of Kenya's 67 African highland biome bird species calling the area home. Additionally, the forest supports at least 35 forest specialist bird species and shelters rare and endangered species like Abbott's Starling.

The forest area harbours a huge population of African Elephants, numbering between 2,000 to 3,000 which can be noticed roaming within the transitional area of the forest and farms. Other fauna within the municipality includes hyenas, monkeys, baboons, jackals and antelopes.

Some of plant species within the vicinity include the acacia, croton, ferns, jacaranda and patches of planted trees along the paths and boundaries forming green belts. Some of the tree species within the forest area include*: Anthocleista grandiflora, Casearia battiscombei, Commiphora eminii, Cordia abyssinica, Croton macrostachyus, Croton megalocarpus, Ehretia cymosa, Ficus sur, and Myrianthus holstii.* Agroforestry trees include: mangoes, avocadoes and macadamia. The area is extensively farmed with tea on the slopes and subsistence farming at the periphery withi town and the rive rhine areas. Some of the crops farmed are: maize, beans, kales and bananas. The river rhine areas are dominated with papyrus and indigenous trees species. Key indigenous and riverine species include: *Diospyros abyssinica, Polycias kikuyuensis, Vangueria apiculata Vangueria infausta Vangueria madagascariensis Ficussur Ficus sycomorus, Lantana camara, Olea europaea, Rhus natalensis, Rhus tenuinervis, Rhus vulgaris, Strombosia scheffleri, Prunus Africana, Dombeya kirkii, Dombeya rotundifolia, Teclea simplicifolia, Teclea nobilis, Syzygium guineense, Erythrina abyssinica, Cordia Africana, Caesalpinia volkensii, Kigelia*

Africana amongst others. The proposed development however shall not disturb the natural vegetation.

The proposed development poses minimal threat to the flora and fauna present in and within the municipality. Less environmentally sensitive ecosystems exist within the project area, while the ecologically sensitive areas have been safeguarded by the provisions outlined in the Environmental and Social Management Plan. There is no flora or fauna listed in the IUCN Red List, which denotes species at risk, will be affected by the project.

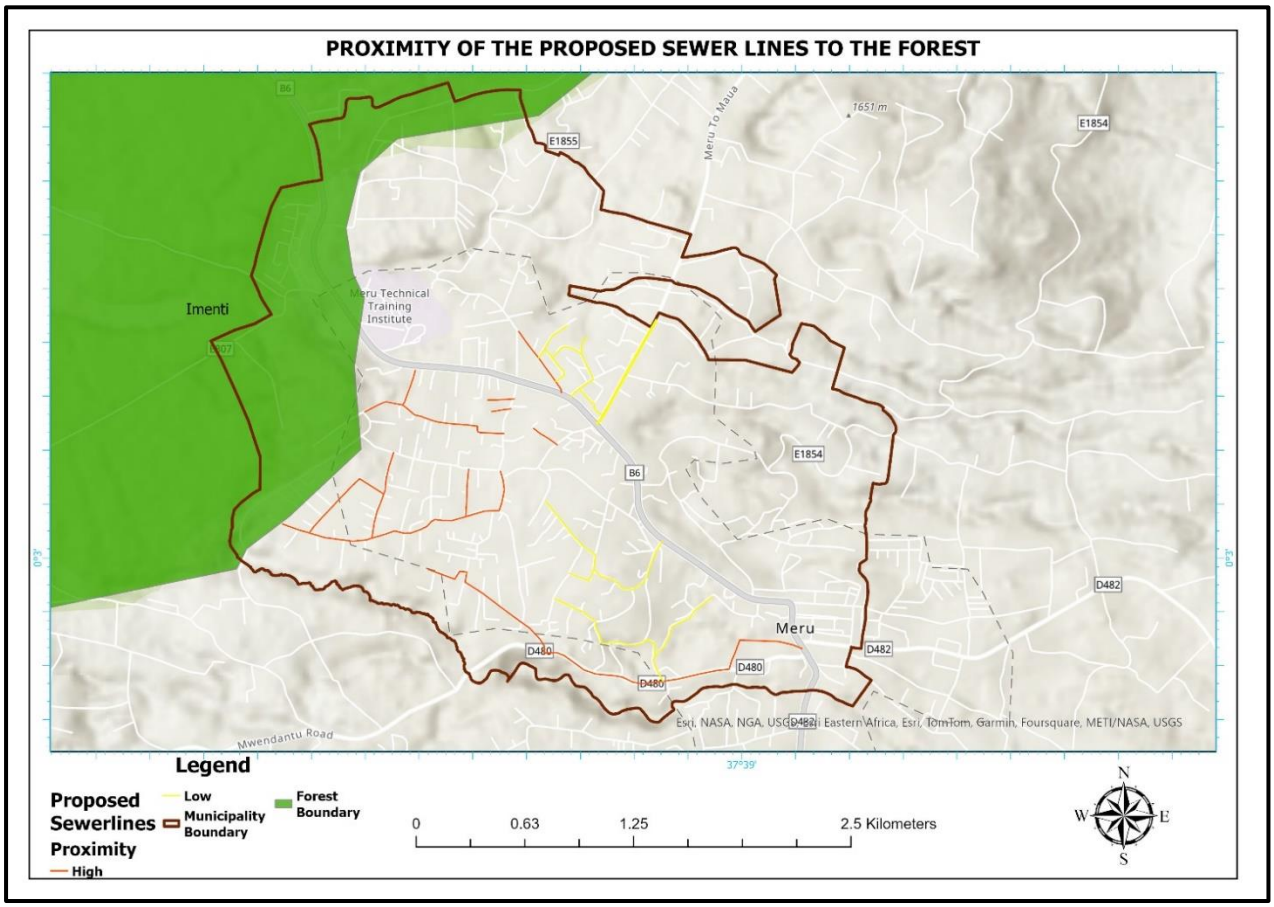


Figure 3-5: Proximity of the municipality to Forest Map

Figure 3-6: A section of Meru forest near the municipality

3.2.5. Climate

The county has varied ecological zones ranging from upper highlands, lower highlands, upper midlands and lower midlands. The distribution of rainfall ranges from 300mm per annum in the lower midlands in the North to 2500mm per annum in the South East. Other areas receive on average 1250mm of rainfall annually

The climatic conditions in the municipality area exhibit a bimodal rainfall pattern, characterized by two distinct rainy seasons. The long rains typically occur from March to June, while the short rains fall between October and December. Annual rainfall averages around 1,500 mm, varying with different altitudes.

Temperatures range from a minimum of 8°C in July to a maximum of 30°C in March, with an average mean temperature of 21°C, influenced by the diverse altitudinal range of the County. July typically marks the coldest month, with an average monthly temperature of 15°C, while September stands as the warmest month, with an average monthly temperature reaching 27.1°C.

3.2.6. Land Use Land Cover

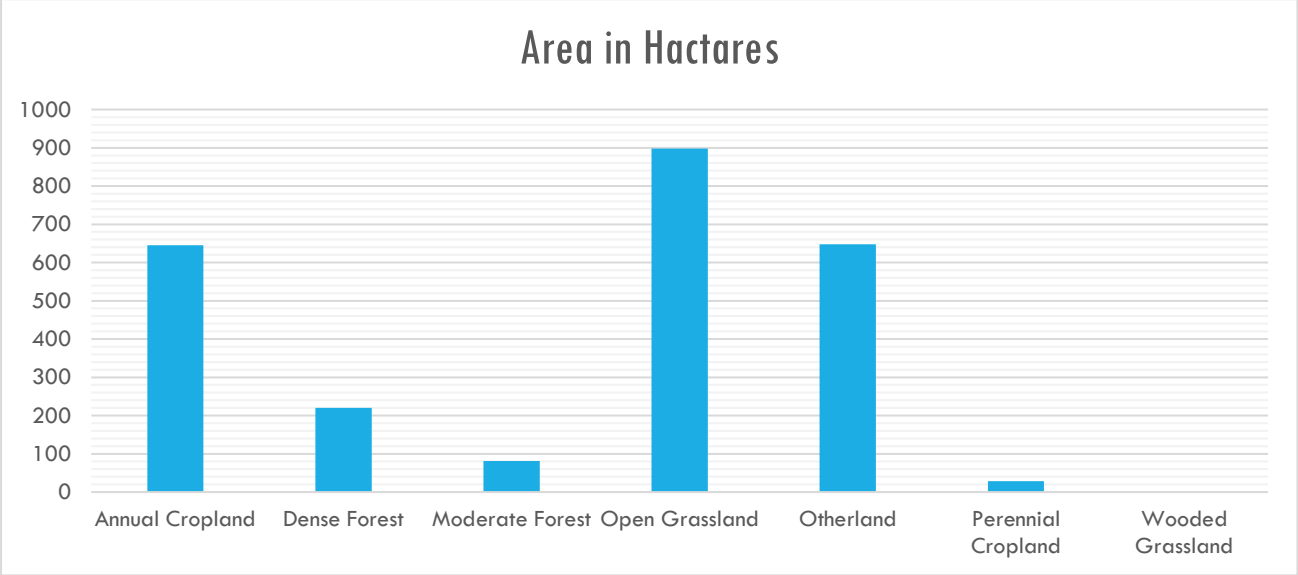
Meru Municipality, typically exhibits a mix of land uses that reflect its urban character, as well as its surrounding agricultural and natural landscapes. The municipality comprise housing developments, ranging from single-family homes to apartment complexes. Residential neighbourhoods varying in density and socio-economic status, with some areas characterized by upscale housing and others by more modest dwellings. The Milimani and Kinoru areas of the municipality hosting high profiled residential status of the municipality.

The Commercial and Business Districts in the Municipality features commercial zones where various businesses operate, including retail stores, restaurants, banks, government offices, and service providers. The central business district (CBD) is typically the hub of commercial activities, however, the Makutano area in Meru has grown in to a huge

commercial business centre hosting more shops, markets, and offices as it is in the CBD area.

The other lands within the municipality have been utilised for agricultural production. The lands have been utilized for crop cultivation, livestock grazing, and agribusiness activities. The main crops grown include: maize, beans, bananas, and horticultural crops. Some areas are still under coffee plantations, macadamia, tea, mangoes and miraa. Livestock production practiced within the municipality area include: dairy and beef farming, goat, sheep, chicken and pig farming. These agricultural areas support the economy and food production, with farming practices ranging from small-scale subsistence farming to larger commercial enterprises.

Land use and land cover data reveal a diverse landscape characterized by various land cover classes. Annual cropland covers a substantial area of 645.58 hectares. Dense forest and moderate forest combined occupy 302.14 hectares, highlighting the significance of Imenti and Meru forests within the municipality. Open grassland, spans across 898.07 hectares, while the other lands cover 648.14 hectares, representing areas that do not fall into the specified land cover classes. These areas include urban infrastructure, barren land, or transitional zones between different land cover types.



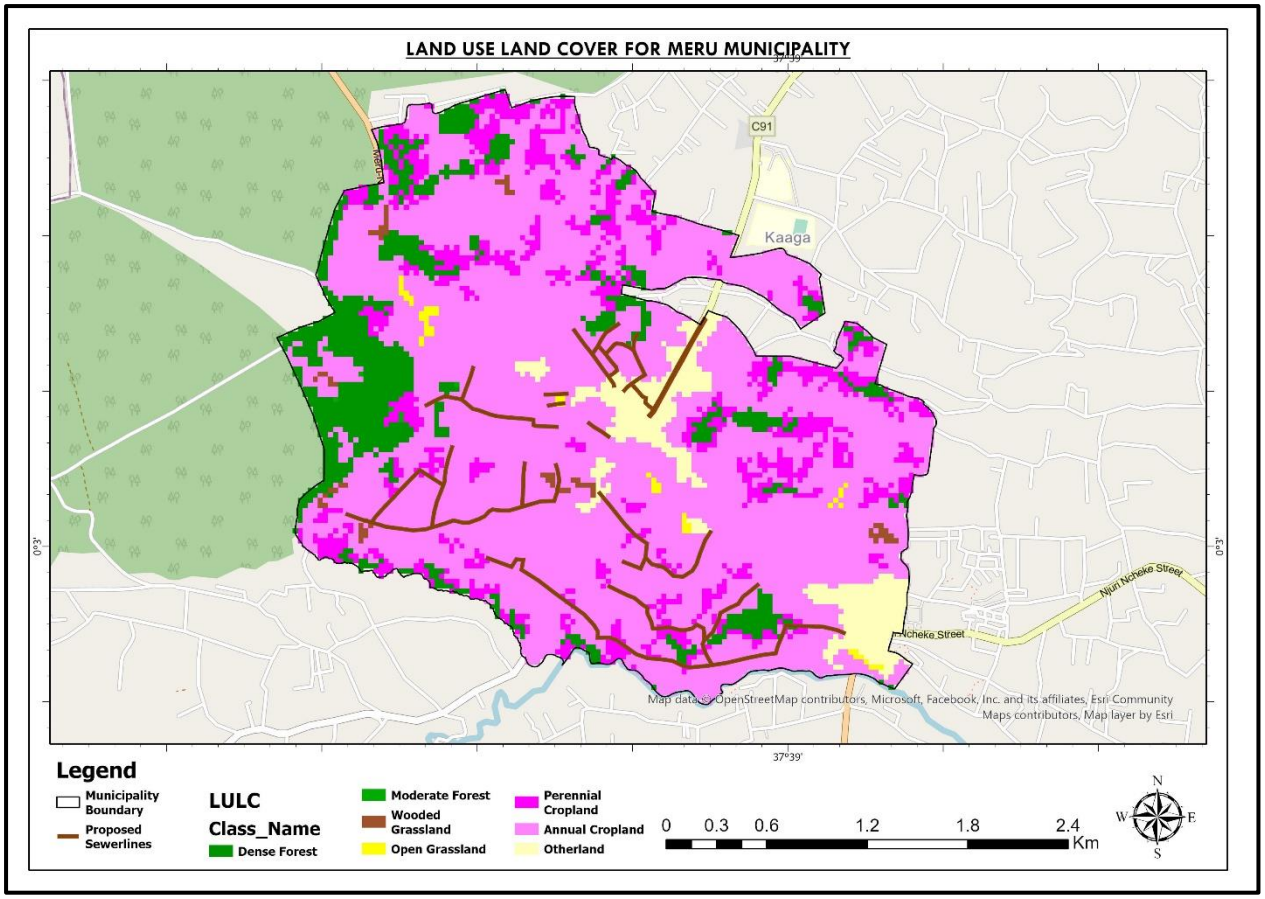


Figure 3-7: Land Use Land Cover for the Project area

3.3. Socioeconomic Environment

3.3.1. Population

The County population as per the 2019 Kenya Population and Housing Census (KPHC) is 1,545,714 consisting of 767,698 males, 777,975 females and 41 intersexes. The County's population growth rate is estimated at 2.1 per cent per annum as per the (Meru CIDP 2023 - 2027 n.d.) The population is expected to rise to 1,643,096 in 2022, 1,746,609 in 2025 and 1,819,966 in 2027.

Population projection is one of the key studies governing the projection of water demand, sewage flow and consequently the capacity of the proposed sewage treatment components. The population data was extracted from the 1999, 2009 and 2019 census data. A design horizon up to 20 years with the Initial Design Year: 2023 Future Design Year: 2033 and the Ultimate Design Year: being 2043

The Design report prepared for the existing system used an annual growth rate of 2.3%. The team has determined an annual growth rate value of 2.1% for the served areas. A figure of 2.2%, which was the average value was adopted as the annual growth rate for the project area.

The scope of the proposed works mainly covers the sub locations in the municipality. The population dynamics of the sublocations have been described in the table below.

Table 3-1: Population dynamics of the municipality

SUB-LOCATION	Population Projection				
	2009	2019	2023	2033	2043
Nthimbiri	2893	3451	744.5	925.5	1150.5
Kirugua	3170	3781	1306.0	1623.5	2018.2
Nchaure	3119	3714	1941.3	2413.3	3000.0
Muringo Mbugi	1553	2418	934.9	1162.2	1444.8
Magundu	5708	8707	11061.9	13751.1	17094.1
Gachanka	4041	5562	5142.7	6392.9	7947.1
Mpuri	5355	5761	370.8	461.0	573.1
Upper Igoki	7917	8518	6998.1	8699.4	10814.2
Tuntu	1331	3496	4441.5	5521.3	6863.6
Township	5484	4156	5280.0	6563.6	8159.3
Lower Igoki	2005	1545	1604.9	1995.1	2480.1
Kanyaugo-Kathita	2834	3553	1791.9	2227.6	2769.1
Gakoromone	9140	11458	14556.9	18095.8	22495.0
Mukua	2326	2739	3479.8	4325.7	5377.4
Kiamwitari	5285	6397	2433.3	3024.8	3760.2
Kaaga-Municipality	9657	11689	14850.4	18460.6	22948.5
Njoka	2310	2263	2875.0	3574.0	4442.9
Chungari	4008	4264	5417.2	6734.2	8371.3
Kirimane	2641	3435	4364.0	5424.9	6743.8
Kaaga-Mulanthankari	3562	4633	5886.0	7317.0	9095.8
Runogone	3115	3922	5775.4	7179.5	8924.9
Kambiti	3127	3771	4706.2	5850.3	7272.5
Total	**87,454**	**95,462**	**105,962**	**131,723**	**163,746**

3.3.2. Settlement Patterns

Settlement patterns in Meru Municipality exhibit a blend of urban and rural characteristics, reflecting its diverse socioeconomic and geographical features. The municipality encompasses a mix of densely populated urban areas, peri-urban zones, and rural villages, each with its distinct characteristics and functions.

The urban areas around Makutano and Kinoru, exhibit a centralized pattern characterized by high population density, diverse commercial activities, and concentrated infrastructure and services. Makutano serve as economic hubs, hosting markets, businesses, government offices, educational institutions, and healthcare facilities. This has been highly impacted by the Meru Maua Road junction with the Meru Nanyuki Road. Residential areas in the locality of Makutano feature a mix of housing types, including high-rise buildings, apartments, and single-family homes.

Peri-urban zones surrounding the urban core of the municipality including Kaaga and Gatoro display transitional settlement patterns, blending urban and rural elements. These areas are characterized with rapid urbanization and expansion due to factors including population growth, rural-to-urban migration, and the development of infrastructure projects. Peri-urban areas typically feature a mix of residential, commercial, and industrial activities, along with agricultural land and green spaces. High end residential area within the zone in the municipality offer lush residential areas with controlled development as displayed in Milimani area of Meru.

Rural villages in Meru Municipality maintain traditional settlement patterns characterized by dispersed homesteads and agricultural land use. These villages are often interconnected by road networks and pathways, with clusters of homes surrounded by farmland and natural vegetation. Rural communities engage in subsistence farming, livestock rearing, and small-scale enterprises, contributing to the local economy and cultural heritage.

3.3.3. Infrastructure and Access

The proposed project locality benefits from an extensive network of tarmacked roads that efficiently cater to the transportation needs of the entire Meru area. These roads play a vital role in facilitating smooth and convenient travel for both residents to the town and rural areas. Major roads traversing through the town are Meru- Nairobi, Meru Maua, Meru-Nkubu and Meru Mitunguu Road. The roads are the major trunk highways in the municipality being maintained by the Kenya National Highways Authority (KeNHA) and the Kenya Rural Roads Authority (KeRRA)

The majority of roads within the Meru municipality are primarily composed of tarmac, cabro and earth, the roads are mainly managed by the Kenya Urban Roads Authority. It is important to note that the Last Mile Connectivity project for the Meru Sewerage project pipelines shall be harboured by these road reserves. These roads are engineered with proper drainage systems to mitigate the risk of flooding and erosion, thereby enhancing their longevity and usability.

3.3.4. Water and Sanitation

Water and sanitation infrastructure plays a pivotal role in the development and well-being the residents in the County. The region is endowed with significant river resources that traverse the county, forming a critical component of its water supply network. The water supply situation in Meru town is not adequate for the present and future population of the town. Water is currently supplied for approximately 15 hours a day with some areas in Meru environs such as Ruiri/Rwarera are completely unserved.

Water in the municipality is mainly provided by the Meru Water and Sewerage Service the WSP endowed to supply clean water within the municipality and urban areas within the county. The WSP currently has approximately 19,248 connections, which serve a population of 121,921.00. The served population is approximately 75% of the total population of 163,302 within the municipality. Mewass is the dominant water service provider in the area, and serves majority of the population. MeWaSS currently draws water

from two main sources River Kathita, and Gatabora Stream this is treated at Milimani and Kigure treatment plants before being supplied to the consumers.

Additionally, there are various community water and irrigation projects offering water within the area including; community water projects, which abstract water from the rivers and convey it to their consumers raw. These are mainly the CEFA water project, Buuri water project

The Meru municipality has an elaborate water supply system and in addition, the town has a sewerage project recently constructed with a capacity to treat wastewater of 11,800m^3 per day. The project was funded by the African Development Bank and the Government of Kenya. The project commenced in the year 2018/2019 and was completed in 2023. The proposed Last Mile Connectivity project will enhance the sanitation services within the project area.

Figure 3-8: Section of Rwanyange Treatment Plant in Meru

3.3.5. Energy

The municipality area is well connected to the electrical power grid serviced by Kenya Power and Lighting Company. All the houses within the municipality are well connected to the national grid. The cables have been connected using the electrical poles. Some of the houses and institutions within the municipality have adopted the use of solar energy as a backup while some have diesel-driven generators

Fuelwood, Charcoal, Petroleum gas and electricity is the main source of cooking fuel with few residents adopting biogas. The area is well supplied with street lights along the access paths, this is an assurance of security and safety for the residents.

3.3.6. Education

The Meru municipality characterised with a diverse array of institutions catering to learners across different stages of development, from early childhood to tertiary education. At the foundational level, Early Childhood Development Education (ECDE) centres play a crucial role in providing essential early learning opportunities for children, typically beginning at the age of four. These centres are often managed by the county government and various community and church-based organizations.

Primary schools serve an estimated 57,000 pupils according to data from the Kenya National Bureau of Statistics. These schools are both publicly and privately owned, managed by the county education board, individuals, and church organizations. Some of the primary schools within Meru Municipality include Kinoru Primary, Meru Saleem Academy, Meru Primary School, Meru Musilm Primary, CCM Meru Township Primary, DEB Township Primary, and St Pauls Primary School.

Secondary education in the area is predominantly provided by public schools. Notable Secondary Schools in Meru include Meru high school, Kaaga Girls High School, Kaaga Boys, Chugu Boys, Mikinduri Girls, and Consolata Girls Secondary School. Additionally, Meru Municipality hosts vocational training institutions Meru National Polytechnic, which offers Technical and Vocational Education and Training (TVET) programs, catering to the skill development needs of the local community. The municipality is also endowed with Kenya Universities including Meru University, and Kenya Methodist University, among others. These institutions play a crucial role in providing quality education and skill development, contributing to the intellectual and socio-economic advancement of the local populace.

Table 3-2: Educational Institutions Water Demand

Category	**Water Demand (m^3/day)**				
	Average consumption rates (l/h/d)	**2019**	**2023**	**2033**	**2043**
ECDE	20	74	78	86	95
Primary Schools	25	478	503	555	613
Secondary Schools	50	413	434	479	529
Tertiary Institutions	50	289	303	335	370
Total		**1,254**	**1,317**	**1,455**	**1,608**

3.3.7. Health

Meru Municipality has a diverse array of healthcare facilities, comprising both public and private establishments, catering for the medical needs of the community. These facilities range from clinics and dispensaries to hospitals, providing essential medical services to residents.

Clinics and dispensaries serve as primary healthcare centers within the Municipality, offering preventive, diagnostic, and treatment services for common ailments and minor injuries. These facilities, many of which are privately owned by individuals or faith-based organizations, including churches, serve as vital points of contact for individuals seeking medical assistance. Some of the dispensaries within the municipality include: Gitoro Dispensary, Kinoru Dispensary, Kathiti Dispensary, and Gakoromone Dispensary. Additionally, clinics such as Equity Afya, MeruCare Clinic, Family care Medical Centre, Medicross medical Clinic, and Grace Park Medical Centre contribute significantly to the provision of primary healthcare services.

Hospitals in Meru Municipality, both public and private, offer more comprehensive medical care, including emergency services, surgical procedures, and specialized treatments for complex health conditions. The main government Level 5 health facility serving the entire County is the Meru County Referral Hospital. Other hospitals within the municipality include The Karen Hospital Meru, Woodlands Hospital, Meru Nursing Home, The Nairobi Women Hospital - Meru, GEM Memorial Hospital, Grace Park Medical Centre, Agakhan Hospital and Life Care Hospital. These hospitals play a critical role in ensuring access to quality healthcare services for residents of Meru.

Table 3-3: Health Institution Water Demand

Category	**Water Demand (m^3/day)**				
	Consumption Rates	**2019**	**2023**	**2033**	**2043**
Hospitals Out Patients	Outpatient (20 l/h/d)	18.	20.8	25.8	32.1
Hospitals Bed Capacity (Inpatient)	Bed Capacity 400l/h/d	183.2	204.3	253.9	315.6
Dispensary	5000 l/d	55.0	61.3	76.2	94.8
Clinic	5000 l/d	145.0	161.7	201.0	249.8
Health Centres	5000 l/d	35.0	36.6	45.4	56.5
Total		**436.8**	**484.6**	**602.4**	**748.8**

3.3.8. Sensitive Receptors

Sensitive receptors for the proposed Last Mile Connectivity for Meru sewerage project were identified based on their proximity to the proposed sewer line routes within the municipality. These receptors include various populations that could potentially be adversely impacted by the project's construction and operation activities. The following table categorizes these receptors:

Table 3-4: Categories of Sensitive receptors

Category	Description
Residential Areas	Milimani area, Gatoro, Kinoru, Makutano, Mwandantu, Gitimbine, Kaaga, Gikumene and Kirunga
Educational Facilities	Mikinduri Girls, Meru National Polytechnic, Consolata girls Highschool, Kinoru Primary School, St Pauls Academy, DEB Township Primary, Kenya Methodist University.
Healthcare Facilities	Kinoru Dispensary, GK Prison Dispensary, Family Care Medica Centre, Medicross clinic, Nairobi Women's Hospital Meru, GEM Memorial Hospital,
Community Facilities	Kinoru Stadium, AIC Meru, PCEA Church Meru, Deliverance Church
Environmental Habitats	None.
Water Sources	Kathitha River

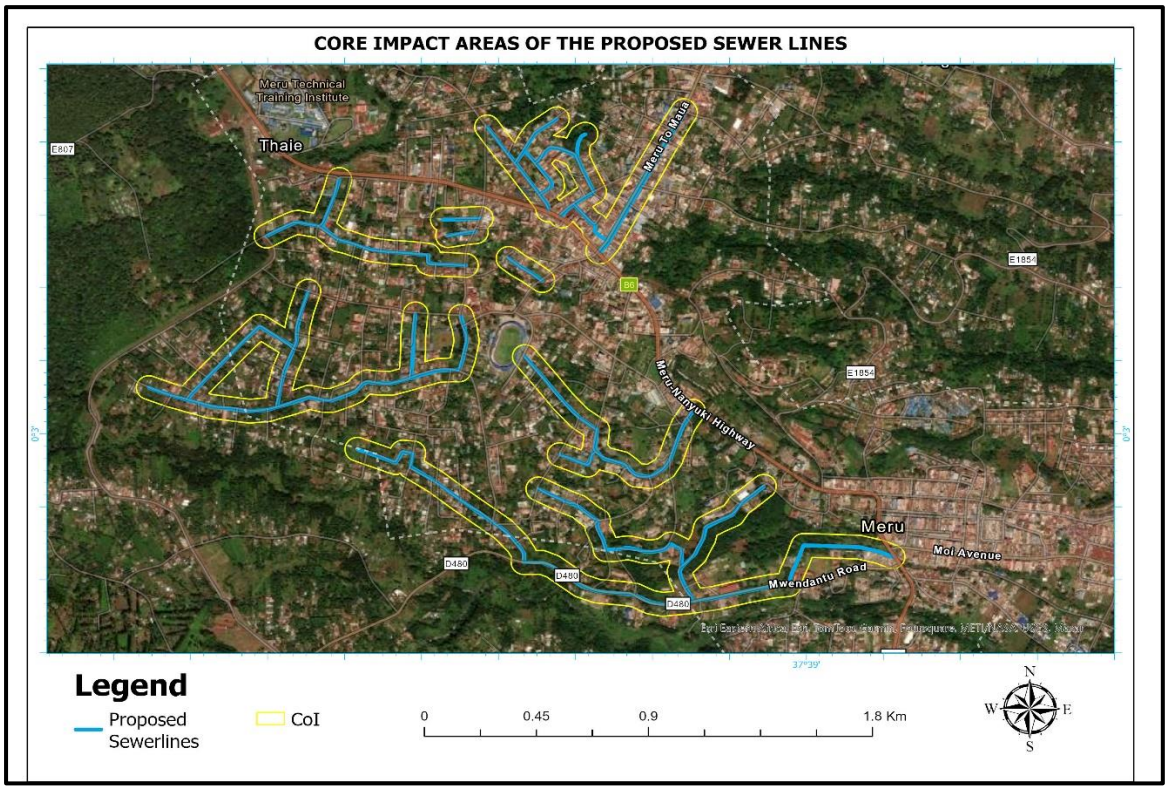


Figure 3-9: Map showing Core Impact Areas

4. POLICY, LEGAL AND REGULATORY FRAMEWORK

This section provides an in-depth analysis of relevant financial institution policies, national environmental regulations, strategic plans, legislation, and multilateral environmental agreements relevant to the proposed project. By examining these frameworks, the chapter seeks to elucidate their impact on the sewer project and highlight the imperative of alignment with these policies for its successful implementation and environmental sustainability.

4.1. The African Development Bank Integrated Safeguards System 2013

Aligned with the Bank's overarching commitment to fostering inclusive and environmentally sustainable growth over the long term, the Bank Group dedicates its operations to aiding Borrowers in conceiving and executing projects, initiatives, and other activities that prioritize environmental and social sustainability. Moreover, the Bank is steadfast in its dedication to bolstering the capacity of member countries and Borrowers to assess and manage the environmental and social risks and impacts associated with their endeavours (AfDB 2013).

In pursuit of this objective, the Bank has established the Environmental and Social Operational Safeguards (OSs), which serve as guidelines to amplify positive outcomes and mitigate adverse environmental and social impacts, including those stemming from climate change, in projects. The Bank is committed to supporting Borrowers in adhering to these OSs throughout the project lifecycle, in accordance with the principles outlined in this Environmental and Social Policy.

The African Development Bank's Environmental and Social Operational Safeguards requirements for the Bank's Borrowers have been discussed in the sub chapters below

4.1.1 OS 1: Assessment and Management of Environmental and Social Risk and Impact

The Environmental and Social Operational Safeguards aim to integrate environmental and social considerations, including climate change vulnerability, into Bank operations to foster sustainable development in the continent. Under OS1, Borrowers are responsible for assessing, managing, and monitoring environmental and social risks and impacts at each stage of Bank-supported operations. This includes stakeholder engagement and disclosing all documentation related to environmental and social assessment (ESA) prior to presenting operations to the Bank's Board of Directors.

The OSs is meant to aid the target economies in managing project risks and improving environmental and social performance through a risk- and outcomes-based approach. OS1 specifically focuses on identifying and assessing environmental and social risks and impacts, including gender inequalities and climate change vulnerabilities, and engaging stakeholders in the assessment process. It emphasizes adopting a mitigation hierarchy approach, which involves anticipating and avoiding risks and impacts, minimizing or

reducing them to acceptable levels, mitigating them, and compensating for or offsetting significant residual impacts where feasible.

The proponent has ensured that the proposed project conforms to the project by engaging the registered and licensed experts to conduct a comprehensive Environmental and Social Impact Assessment. The ESIA Process adhered to the NEMA and the AfDB Operational Safeguards to the letter. All the stakeholders with interest in the project including the PAPs were involved in the entire process. This culminated to the development of an ESIA report with a comprehensive Environmental and Social Management Plan to ensure that all the impacts of the projects are duly mitigated.

4.1.2 OS 2: Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement

This safeguard emphasizes the avoidance and minimization of involuntary resettlement, where possible. The OS acknowledges the potential negative consequences of project-related land acquisition, land access restrictions, and property loss on communities and individuals. These impacts can include physical displacement (such as relocation or loss of shelter) and economic displacement (resulting in the loss of land, assets, or livelihood opportunities), or both. Involuntary resettlement encompasses these impacts and the processes to mitigate and compensate for them. Resettlement is deemed involuntary when affected persons or communities lack the genuine opportunity, free from coercion or intimidation, to refuse land acquisition or access restrictions leading to asset loss or displacement.

If left unaddressed, physical and economic displacement can lead to severe economic, social, and environmental risks. This includes the dismantling of production systems, potential impoverishment due to loss of productive resources or income sources, relocation to less conducive environments, weakening of community institutions and social networks, exacerbation of social inequalities, dispersion of kin groups, and erosion of cultural identity and traditional authority. Therefore, the safeguard emphasizes the avoidance of involuntary resettlement whenever possible. In unavoidable instances, efforts will be made to minimize it, and appropriate measures to mitigate adverse impacts on displaced persons (and host communities) will be carefully planned and implemented. Prior to implementing physical investments supported by the Bank

The Meru LMC for the Sewerage Project has avoided involuntary resettlement by utilizing the road reserve. In addition, a Resettlement Action Plan (RAP) has been developed to address any potential impacts on Project Affected Persons (PAPs), ensuring adequate compensation if necessary.

4.1.3 OS 3: Habitat and Biodiversity Conservation, and Sustainable Management of Living Natural Resources

This safeguard aims to conserve biodiversity and promote sustainable natural resource management. It further reflects the objectives of the Convention on Biological Diversity to conserve biological diversity and promote the sustainable management and use of

natural resources. It also aligns with the Ramsar Convention on Wetlands, the Convention on the Conservation of Migratory Species of Wild Animals, the Convention on International Trade in Endangered Species of Wild Flora and Fauna, the World Heritage Convention, the United Nations Convention to Combat Desertification, and the Millennium Ecosystem Assessment. Its recommendations also align with the International Plant Protection Convention, which covers the movement of invasive alien species and pests, as well as pest risk analysis for quarantine pests, including an analysis of the risks and impacts of genetically modified organisms. OS6 recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development.

The Environmental and Social Impact Assessment (ESIA) process included an assessment of the project's impact on biodiversity and ecosystems, with mitigation measures outlined in the ESMP to prevent severe impacts. The proposed development poses minimal threat to the flora and fauna present in and within the municipality. Less environmentally sensitive ecosystems exist within the project area, while the ecologically sensitive areas have been safeguarded by the provisions outlined in the Environmental and Social Management Plan. There is no flora or fauna listed in the IUCN Red List, which denotes species at risk, will be affected by the project.

4.1.4 OS.4: Resource Efficiency and Pollution Prevention and Management

This safeguard focuses on preventing pollution and efficiently managing resources. This Operational Safeguard (OS) recognizes that economic activities often cause air, water, and land pollution, and consume finite resources that may threaten people, ecosystem services, and the environment at the local, regional, and global levels. The current and projected atmospheric concentration of greenhouse gases (GHGs) threatens the welfare of current and future generations. In addition, more efficient and effective resource use, pollution prevention, and GHG emission avoidance, and mitigation technologies and practices have become more accessible and achievable. OS3 sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle in a manner consistent with Good International Industry Practice (GIIP)

As preliminary of the project a Waste Management Plan and an Effluent Discharge Control Plan has been developed to guide waste reduction, segregation, collection, and disposal practices, ensuring compliance with international best practices. Solid waste generated during the sewerage treatment process will be recycled through composting and sold as manure to rural farmers. Effluent water from the treatment process will undergo testing before release into the environment or use for irrigation purposes.

4.1.5 OS5: Labour and Working Conditions

This safeguard addresses risks related to labour and working conditions. This safeguard establishes the AfDB's requirements for its borrowers or clients concerning workers' conditions, rights and protection from abuse or exploitation.

Various types of workers will be engaged in the project, including civil servants, workers from the Tana Water Works Development Authority (TWWDA), contractor workers, consultants, and community workers. Potential labour risks include environmental, health, and safety hazards, sexual harassment and exploitation, child labour, forced labour, disputes over employment terms and conditions, and discrimination against vulnerable groups. Measures to manage these risks include adherence to minimum wage regulations, limitations on working hours, provision of rest periods, annual leave entitlements, maternity and paternity leave, death benefits, and medical treatment for injured workers. The contractor will adhere to all the best practices to ensure the health and safety of employees is well taken care of.

Specific measures shall be undertaken by the contractor in conjunction with the proponent to protect vulnerable groups of workers, such as women, persons with disabilities, and youth (if any are employed in accordance with relevant regulations), ensuring they are not exploited and are provided with necessary support

4.2. Relevant National Policies and Strategies

4.2.1 The Constitution of Kenya, 2010

The Constitution holds the highest legal authority in the nation and forms the foundation of Kenya's well-being. Its provisions are tailored to ensure the sustainable and productive management of land resources, the transparent and cost-effective administration of land, and the effective conservation and protection of ecologically sensitive areas.

Article 21 (3) outlines that all branches of government and public officials bear the responsibility of addressing the needs of vulnerable segments within society. This includes women, the elderly, persons with disabilities, children, youth, members of marginalized communities, and those from specific ethnic, religious, or cultural backgrounds.

Article 42 asserts the right of every individual to a clean and healthful environment, encompassing the following aspects:

- The safeguarding of the environment for the benefit of present and future generations through legislative measures and other strategies, particularly those detailed in article 69.
- The fulfilment of obligations concerning the environment as detailed under article 70. Section 69 specifies that the state shall:
- Promote public participation in environmental management, protection, and conservation.
- Institute mechanisms for environmental impact assessment, environmental auditing, and environmental monitoring.
- Eliminate processes and activities that pose potential harm to the environment.

It is anticipated that the guiding principles of Kenya's constitution with regard to environmental preservation and conservation will direct the construction and operation of the proposed sewer treatment and the associated infrastructure. The project proponent will make earnest efforts to ensure that the rights of marginalized and vulnerable groups

are duly considered in all project-related decisions. Through this Comprehensive Project Report and the Environmental and Social Management Plan (ESMP), the proponent has undertaken proactive measures to ensure that the project contributes positively to a clean and healthful environment for the community

4.2.2 The Kenya Vision 2030

The Vision 2030 maps the development agenda by seeking to make Kenya a globally competitive middle- income country by 2030 (GoK 2012). Chapter 5 of the Vision 2030 blueprint focuses on education, health, water, environment, housing and urbanization amongst other sectors. Vision 2030 is being implemented through a series of five-year Medium- Term Plans (MTP). The MTP identifies the key policy actions and programs for each Ministry Department and Agency (MDA).

The overarching objective of the Environment, Water, and Sanitation Sector, as highlighted in the Vision, is to achieve a "clean, secure, and sustainable environment" by the year 2030. The planned development initiatives are focused on enhancing the overall health and hygiene conditions of the community. Furthermore, a dedicated Environmental and Social Impact Assessment for the sewer project has been undertaken to ensure effective mitigation of any potential negative environmental consequences that could arise from the project's execution.

4.2.3 The Sessional Paper No 1 on National Water Policy 2021

The Sessional Paper proposed a range of measures and actions through which Kenya can respond to the challenges facing the water sector. The Policy re-engineered the water sector through interventions that are geared towards achieving sustainable development in Kenya and in consonance with the sustainable Development Goals, 2030 (GoK 2021). The policy is geared to addressing the emerging challenges and realities in the sector more specifically addressing low sewerage coverage and supply of water resulting from rising population and expansion of economic activities across the sector

This undertaking therefore conforms with the government policy as it aims to increase access to sewerage services in Meru. The relocation of the sewer will give room for increased sewer coverage in Meru to improve the hygiene of the municipality. With the growing population in Meru there is need to readjust the sewerage infrastructure to satisfy the needs of the town

4.2.4 National Policy on Water Resources Management and Development (1999)

The Sessional paper No. 1 of 1999 was established with the objective of preserving, conserving and protecting available water resources and to ensure that water is allocated in a sustainable, rational and economic way. The policy further desires to provide water of good quality and in sufficient quantities that meets the various water needs while ensuring safe disposal of waste water and environmental protection. To achieve these goals, water

provision through increased household connections and developing other resources and improved sanitation is required.

While the National Policy on Water Resources Management and Development (1999) enhances a systematic development of water facilities in all sectors of socio-economic progress, it recognizes the by-products of this process as waste water. The proposed project is towards providing sufficient access to sewer by the residents Meru

The planned Last mile Connectivity of the Meru Sewerage is expected to yield benefits for huge town and urban area population, both directly and indirectly. The primary objective of the proposed efforts is to improve the community's access to improved sanitation and hygiene. The proposed developmental activities are designed to safeguard the community and water sources from potential disease-causing organisms.

Given that the project will involve activities that may be harmful to the environment, it is imperative for the project proponent to establish comprehensive strategies and plans for managing wastewater. Appropriate measures need to be put in place to ensure responsible effluent discharge management that adheres to environmental standards and safeguards the local ecosystem.

4.2.5 Sessional Paper No. 10 of 2014 on the National Environment Policy

The Republic of Kenya has a policy, legal and administrative framework for environmental management. This Policy sets out important provisions relating to the management of ecosystems and the sustainable use of natural resources. The policy further acknowledges that natural resources are under immense pressure from human activities particularly for critical ecosystems including forest, grasslands and arid and semi-arid lands.

The policy seeks to develop an integrated approach to environmental management, strengthening the legal and institutional framework for effective coordination, promoting environmental management tools. Under the National Environment Policy, the government will;

- Ensure optimal use of natural resources while improving environmental quality.
- Conserve natural resources such that the resources meet the needs of the present without jeopardizing future generations in enjoying the same.
- Develop awareness that inculcates environmental stewardship among the citizenship of the country.
- Integrate environmental conservation and socio-economic aspects in the development process.
- Ensure that national environmental goals contribute to international obligations on environmental management and social integrity
- Ensure Strategic Environment Assessment (SEA), Environmental Impact Assessment, Social Impact Assessment and Public participation in the planning and approval of infrastructural projects.
- Develop and implement environmentally-friendly national infrastructural development strategy and action plan.

- Ensure that periodic Environmental Audits are carried out for all infrastructural projects

To achieve this, it is a policy direction that appropriate reviews and evaluations the proposed LMC of Meru Sewerage and operations are checked to ensure compliance with the environmental policy. The ESIA process ensure that conservation strategies are laid down in the in the critical decision points of the project

4.2.6 National Environmental Sanitation and Hygiene Policy, 2016

The National Environmental Sanitation and Hygiene Policy is dedicated to addressing environmental sanitation and hygiene matters in Kenya, serving as a significant contribution to enhancing the dignity, health, welfare, social well-being, and overall prosperity of all residents in the country. The (Kenya environmental Sanitation and Hygiene Policy 2016)acknowledges that the foundation of healthy and hygienic behaviours and practices originates at the individual level.

The proposed last mile connectivity of the Meru Sewerage project is in harmony with the policy's objectives to bolster sanitation, hygiene, the utilization of safe drinking water, and effective wastewater management at the household level. In accordance with the fundamental human right to live with dignity in a clean and sanitary environment, every Kenyan should have the opportunity to do so.

The intended works are designed to actively contribute to the enhancement of sanitation and hygiene within the Meru municipality. The proposed development will strictly adhere to the hygienic and sanitation practices set forth in the policy.

4.2.7 Gender Policy, 2011

This Policy Framework aims at mainstreaming gender concerns in the national development process in order to improve the social, legal/civic, economic and cultural conditions of women, men, girls and boys in Kenya. The policy provides direction for setting priorities to ensure that all ministerial strategies and their performance frameworks integrate gender equality objectives and indicators and identify actions for tackling inequality. In addition, each program will develop integrated gender equality strategies at the initiative level in priority areas. Within selected interventions, the policy will also scale-up specific initiatives to advance gender equality.

This policy will be referred to during project implementation especially during hiring of staff to be involved in the implementation of the project. Moreover, the project will be of benefit to women and girls by providing opportunities to reduce poverty and food insecurity among the rural poor households by improving the performance of irrigation and marketing infrastructure, as well as enhanced methods of post-harvest management.

The proponent through this ESIA has carried out adequate social assessment of the project and through the ESMP provided adequate measures to comply with the provisions of this legislations on; national legal and policy provisions on gender, HIV/AIDS and Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA).

4.3. Relevant Legislative Framework

There are several legal provisions on environmental protection, which touch on and regulate the development of infrastructure like the proposed Last Mile Connectivity of Meru Sewerage project. A brief review of the various legislations relevant to the development is given hereunder.

4.3.1. Environmental Management and Coordination Act CAP 387 and EMCA Amendments 2015

The Environmental Management and Coordination Act (EMCA) of Cap 387 was enacted to provide an appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto. EMCA does not repeal the sectoral legislation but seeks to coordinate the activities of the various institutions tasked to regulate the various sectors. These institutions are referred to as Lead Agencies in EMCA. Lead Agencies are defined in Section 2 as any government ministry, department, parastatals, and State Corporation or local authority in which any law vests functions of control or management of any element of the environment or natural resource.

EMCA Cap 387 applies to all policies, plans and programs as specified in part IV, part V and the Second Schedule of the Act. A number of legislations are in place to ensure the provision of a healthy and clean environment but EMCA Cap 387 takes precedence. It is the principal law that governs the use, management and regulation of environmental resources in Kenya.

Under the second schedule, amended via (Legal Notice 31 & 32 of 2019 on EIA 2019), the proposed project is categorized as a High-Risk Project. However, based on the advice by the authority the magnitude of rehabilitation works is have guaranteed development of a Project Report This Comprehensive Project Report (CPR) has been prepared for submission pursuant to Regulation 7 (4) of the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019. The assessment was conducted following recommendation under sub regulation 3 (a). Below is a highlight of key regulations under EMCA, Cap 387;

4.3.2. ESIA and EA regulations (EIA regulations 2003)

The regulations specify the necessary steps and guidelines for conducting an EIA and Environmental Audit, covering various aspects of environmental assessment and mitigation measures. The ultimate goal is to ensure the submission of a comprehensive report to NEMA, thus contributing to effective environmental management and compliance with regulatory frameworks.

The regulations further stipulate that a qualified expert(s) should prepare a report based on the assessment and audit, which must be submitted to the National Environmental Management Authority (NEMA). This ensures compliance with the regulatory requirements and facilitates the appropriate management of environmental impacts.

The ESIA process was conducted in accordance with the regulations, involving qualified experts and following the guidance provided by NEMA. The proponent is dedicated to adhering to the environmental management plan specified in the ESIA report, ensuring responsible environmental practices and the effective management of potential impacts

4.3.3. Environmental Management and Coordination (Environmental Impact Assessment and Audit) Regulations, 2003 (amended 2019)

These regulations stipulate the steps to be followed when undertaking an Environmental Impact Assessment, and Environmental Audit. The regulations stipulate the ways in which environment impact assessment and audits should be conducted. The regulations require that the Environmental Impact Assessment and Environmental Audit be conducted in accordance with the issues and general guidelines spelled out in the second and third schedules of the regulations. These include coverage of the issues on schedule 2 (ecological, social, landscape, land use, and water considerations) and general guidelines on schedule 3 (impacts and their sources, sub-projects details, national legislation, mitigation measures, a management plan, and environmental auditing schedules and procedures. In the second schedule amended in 2019, the project is classified as a low-risk project. It finally states that a project report, drawn by a qualified expert(s) should then be filed to the National Environmental Management Authority (NEMA).

In carrying out the ESIA and writing the report the requirements of this regulations and those of the international Social Safeguards were integrated and followed throughout the process. The proponent did the screening and scoping then as advised by the NEMA office commissioned a comprehensive ESIA study. The proponent shall observe the guidelines as set out in the environmental management plan laid out in the ESIA report as well as the recommendation provided for mitigation, minimization, and avoidance of adverse impacts arising from the project activities.

4.3.4. Environmental Management and Coordination (Water Quality) Regulations, 2006

Water Quality Regulations apply to water used for domestic, industrial, agricultural, and recreational purposes; water used for fisheries and wildlife purposes, and water used for any other purposes. Different standards apply to different modes of usage. These regulations provide for the protection of lakes, rivers, streams, springs, wells and other water sources. The effective enforcement of the water quality regulations will lead to a marked reduction of water-borne diseases and hence a reduction in the health budget. The regulations also provide guidelines and standards for the discharge of poisons, toxins, noxious, radioactive waste or other pollutants into the aquatic environment in line with the Third Schedule of the regulations. The regulations have standards for discharge of effluent and sewer into aquatic environment. While it is the responsibility of the sewerage service providers to regulate discharges into sewer lines based on the given specifications, NEMA regulates discharge of all effluent into the aquatic environment. Everyone is required to refrain from any actions, which directly or indirectly cause water pollution, whether or not the water resource was polluted before the enactment of the Environmental Management and Coordination Act (EMCA Cap 387).

The Proponent has adhered to the provisions of this regulation to protect the proposed water resource from all possible pollution during the construction and the operation phase by carrying out this ESIA. Considering the technology undertaken, the proposed project

will adhere the effluent compositions as it is in schedule IV of the regulations to endure the project have minimal impacts on the ecosystem. The proponent has outlined the water quality control measures in the ESIA through the development of an Effluent Discharge Plan.

4.3.5. Environmental Management and Coordination (Waste Management) Regulations, 2006

These regulations stipulate how the different types of waste streams should be stored, transported, and disposed of. The type of waste streams described herein include solid waste, industrial waste, hazardous waste, pesticides and toxic substances, biomedical waste and radioactive substances. The regulations also stipulate the conditions for licensing any person dealing with the transport or waste disposal. The regulations prohibit anyone from disposing of any waste on any part of the environment except in designated waste receptacle or facility provided by the relevant local authority which may be legitimate dumpsites or landfills.

Since the proposed works will generate waste in form of waste soils during construction, human waste during operation and other solid wastes this act provides for the waste generator to be responsible for the collection, segregation at source and proper disposal of their wastes. Through the ESMP and the Effluent Discharge Plan the proponent has provided measures for managing waste generated through this sub project. The proponent will comply with the provisions of EMCA in managing wastes as stipulated under waste management regulations by offering proper guidelines in waste management.

4.3.6. Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009

These regulations prohibit any person from making or causing any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment. It also stipulates the factors to be considered when determining the amount of noise produced from various sources. The regulations further provide the permissible noise levels within different neighbourhoods at different times. In determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered:

- Time of the day;
- Proximity to residential area;
- Whether the noise is recurrent, intermittent or constant;
- The level and intensity of the noise;
- Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and,
- Whether the noise is subject to be controlled without unreasonable effort or expense to the person making the noise.

The regulations give permissible noise levels for silent zones, places of worship, residential (indoor/outdoor), mixed residential; and commercial.

4.3.7. Environmental Management and Coordination (Air Quality) Regulations, 2014

These regulations provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It applies to all internal combustion engines, all premises, places, processes, operations, or works to which the provisions of the Act and Regulations made thereunder apply, and any other appliance or activity that the Cabinet Secretary may by order in the Gazette, specify. They stipulate the measures to prevent air pollution from both stationary and mobile phases. They also provide for the permissible occupational exposure limits.

The proponent will ensure that ambient air quality is maintained during the during the project life cycle. The proposed works will ensure compliance with Air quality regulations by enforcing all the proposed preventive and mitigation measures in the ESMP.

4.3.8. Water Act, 2016

This Act provides the legal framework for the regulation, management and development of water resources and water, and sewerage services in line with the Constitution. The Act gives provisions regarding ownership of water, institutional framework, national water resources, management strategy, and requirement for permits, state schemes and community projects. The act gives Mandate Water Resources Authority to manage and monitor all water related resources. The proposed Last mile connectivity of the Meru Sewerage project is a subsidiary of the large sewerage projects which complied with the Act by acquiring the necessary permits from the relevant bodies in relation to water resources

4.3.9. Climate Change Act 2016

The Climate Change Act of 2016 provides a regulatory framework aimed at enhancing responses to climate change, promoting mechanisms, and implementing measures to support low-carbon climate development. In the context of the Meru Last Mile Connectivity for Sewerage project, this legislation highlights the importance of reducing carbon emissions and transitioning towards a low-carbon future. This entails adopting construction practices and technologies that minimize carbon footprint.

The Act also emphasizes the importance of building resilience to counter the impacts of climate change. With the increasing occurrence of extreme weather events such as floods and storms, it is essential for the LMC project to design infrastructure capable of withstanding these challenges. The project has been adequately designed to consider potential impacts of extreme weather events on the infrastructure. Assessments, including this Environmental and Social Impact Assessment (ESIA), align with the Act's focus on adaptation and preparedness.

4.3.10. Land Act, 2012 (The Land Laws (Amendment) Act, 2016 No. 28 of 2016)

This is an Act of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land- based resources, and for connected purposes. Part VIII of this Act provides procedures for compulsory acquisition of interests in land. Section 111

States that if land is acquired compulsorily under this Act, just compensation shall be paid promptly in full to all persons whose interests in the land have been determined.

The Act also provides for settlement programs. Any dispute arising out of any matter provided for under this Act may be referred to the Land and Environment Court for determination. Under section 3. (1) the Act applies to all land declared as— (a) public land under Article 62 of the Constitution; (b)private land under Article 64 of the Constitution; and (c) community land under Article 63 of the Constitution and any other written law relating to community land. In section 8(d) the Commission on behalf of the National or County Government may require the land to be used for specified purposes and subject to such conditions, covenants, encumbrances or reservations as are specified in the relevant order or other instrument.

The proposed LMC for the Meru Sewerage project shall fully utilise the road reserves to minimise any form of livelihood displacement. The project proponents have made necessary arrangement for a Resettlement Action Plan in case there are instances of loss of livelihood through land. This has been undertaken in regards also to the requirements of the AfDB Integrated Safeguards Policies

4.3.11. Occupational Safety and Health Act (OSHA 2007)

Occupational Safety and Health Act applies to all workplaces where any person is at work, whether temporarily or permanently. The purpose of the Act is to secure the safety, health and welfare of persons at work and protect persons other than persons at work against risks to safety and health arising out of the activities of persons at work. Section 19 of the Act provides that an occupier of any premises likely to emit poisonous, harmful, injurious or offensive substances, into the atmosphere shall use the best practicable means to prevent such emissions into the atmosphere and render harmless and inoffensive the substances which may be emitted. This Act was found relevant for reference in this ESIA since the construction phase will involve workers who will be exposed to various occupational hazards.

There will be the need to ensure that all employees and people around the area are protected against any risks that could arise from the operations, hence the provisions of this Act will be incorporated. A comprehensive occupational health and safety audits will be carried out periodically to ensure compliance with this Act particularly in the construction phase.

4.3.12. The Public Health Act (Cap. 242) Revised 2012

Section 115 of the Act states that no person/institution shall cause a nuisance or condition liable to be injurious or dangerous to human health. The law requires that all lawful, necessary, and reasonably practicable measures be taken to maintain areas under jurisdiction clean and sanitary to prevent the occurrence of nuisance or condition liable for injurious or dangerous to human health.

Section 136 state that all collections of water, sewage, rubbish, refuse and other fluids which permits or facilitate the breeding or multiplication of pest shall be deemed nuisances and to be dealt with in the manner provided by this Act.

The proponent through this ESIA, the Effluent Discharge Plan and the ESMP has defined the necessary measures to be taken by the Contractor, and other responsible parties to prevent the occurrence of nuisance or condition liable for injurious or dangerous to human health during the construction and the operation phase of the project.

4.3.13. County Governments Act, 2012

This is an Act of parliament to give effect to Chapter Eleven of the Kenyan Constitution; to provide for the County government's powers, functions and responsibilities to deliver services and for connected purposes. The Act lays emphasis on the need for a consultative and participatory approach where the principles of planning and development facilitation in a county serve as a basis for engagement between the county government and the citizens and other stakeholders. Specifically, Part VIII of the Act outlines the principles of citizen participation in counties as;

- Timely access to information, data, documents, and other information relevant or related to policy formulation and implementation;
- Reasonable access to the process of formulating and implementing policies, laws, and regulations, including the approval of development proposals, sub-projects, and budgets, the granting of permits and the establishment of specific performance standards;
- Protection and promotion of the interest and rights of minorities, marginalized groups and communities and their access to relevant information;
- legal standing to interested or affected persons, organizations, and where pertinent, communities, to appeal from or, review decisions, or redress grievances, with particular emphasis on persons and traditionally marginalized communities, including women, the youth, and disadvantaged communities;
- Reasonable balance in the roles and obligations of county governments and non-state actors in decision-making processes to promote shared responsibility and partnership, and to provide complementary authority and oversight;

The Proponent has complied with the outlined principle of citizen participation and those of other stakeholders through the planning, screening, designing and ESIA process.

4.3.14. National Gender and Equality Act, 2011

National Gender Equality Commission is a constitutional Commission established by an Act of Parliament in August 2011, as a successor commission to the Kenya National

Human Rights and Equality Commission pursuant to Article 59 of the Constitution. NGEC derives its mandate from Articles 27, 43, and Chapter Fifteen of the Constitution; and section 8 of NGEC Act (Cap. 15) of 2011, with the objectives of promoting gender equality and freedom from discrimination.

Gender mainstreaming in development endeavours guarantees that both the interests of women and men are fully integrated into every facet of the project's design, execution, operation, and subsequent monitoring and evaluation processes. This approach ensures equitable benefits for both genders, while simultaneously working to prevent the perpetuation of any existing inequalities.

4.3.15. Employment Act, 2007

The Act is enacted to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations and federations. The purpose of the Act is to promote sound labour relations through freedom of association, the encouragement of effective collective bargaining and promotion of orderly and expeditious dispute for the protection and promotion of settlements conducive to social justice and economic development for connected purposes. This Act is important since it provides for an employer employee relationship that is important for the execution of the project.

The Proponent through the Contractor will make sure that fairness and gender equity are followed during the recruitment of the labour force to be used during the construction phase.

4.4. Institutional Framework

4.4.1. The Land and Environment Court Act, 2012

This is an Act of Parliament to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. The principal objective of this Act is to enable the Court to facilitate the just, expeditious, proportionate and accessible resolution of disputes governed by this Act.

Section 13 (2) (b) of the Act outlines that in exercise of its jurisdiction under Article 162 (2)

(b) Of the Constitution, the Court shall have power to hear and determine disputes relating to environment and land, including disputes:

- Relating to environmental planning and protection, trade, climate issues, land use planning, title, tenure, boundaries, rates, rents, valuations, mining, minerals and other natural resources;
- Relating to compulsory acquisition of land;

- Relating to land administration and management;
- Relating to public, private and community land and contracts, chooses in action or other instruments granting any enforceable interests in land; and
- Any other dispute relating to environment and land.

Section 24 (2) also states that the Chief Justice shall make rules to regulate the practice and procedure, in tribunals and subordinate courts, for matters relating to land and environment.

Section 30 (1) states that all proceedings relating to the environment or to the use and occupation and title to land pending before any Court or local tribunal of competent jurisdiction shall continue to be heard and determined by the same court until the Environment and Land Court established under this Act comes into operation or as may be directed by the Chief Justice or the Chief Registrar.

Any land or/and environmental cases arising from the project will be handled in accordance with the provisions of this Act. Land is a basic factor of production for any development. The proponent shall acquire the land at the proposed project site and the wayleaves via the acceptable standards put up by the court. In the event of any issues, the requirements of the court should be adhered to during project implementation.

4.4.2. The National Environment Council

The National Environmental Council is responsible for policy formulation and directions for the purposes of the Act. The Council also sets national goals and objectives, and determines policies and priorities for the protection of the environment. *The proponent shall ensure that the project abides by the set goals and objectives of the council.*

4.4.3. The National Environment Management Authority

The responsibility of the National Environmental Management Authority (NEMA) is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment.

In addition to NEMA, the Act provides for the establishment and enforcement of environmental quality standards to be set by the Cabinet Secretary in consultation with the Authority, which will govern the discharge, limits to the environment by the proposed project.

NEMA must approve the project before implementation and also participates in subsequent stages of construction environmental management and annual audits review.

4.4.4. County government of Meru

The County Government is established by the Constitution of Kenya 2010 and operates under the Cities and Urban Areas Act, The Devolved Governments Act, and other relevant

legislation. It is responsible for providing various services to the residents of Meru Municipality, including those previously provided by the defunct Municipal Council and services transferred from the national government.

The former includes Physical Planning, Public Health, Social Services and Housing, Primary Education Infrastructure, Inspectorate Services, Public Works, Environment Management while the latter include Agriculture, Livestock Development and Fisheries, Trade, Industrialization, Corporate Development, Tourism and Wildlife, Public Service Management and Water services.

The County Government plays a vital role to ensure sound waste management and control of the environmental degradation within its jurisdiction, so they will also act to ensure that the proponent manages its environment well.

4.5. International Policy Framework

Kenya as a whole, is committed to various international conventions, treaties, and protocols aimed at promoting sustainable development and environmental protection. According to the Registrar of International Treaties and other Agreements in Environment (UNEP 1999), there are 216 treaties, 29 of which are relevant to Kenya. Kenya is a signatory to 16 such agreements, covering areas such as the use of natural resources, protection of the atmosphere, and social well-being. These agreements, whether regional or international, become legally binding upon Kenya upon ratification by the appropriate authority.

4.5.1. United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC mandates parties to consider climate change in their social, economic, and environmental policies and actions. In line with this, the ESIA for the proposed project aims to minimize adverse effects on the economy, public health, and the environment. Compliance with this convention involves mitigating climate change impacts, such as by planting trees suited to the area. Additionally, the proponent is encouraged to enhance positive impacts by engaging in activities like tree planting and watershed conservation.

4.5.2. The World Commission on Environmental and Development

This commission emphasizes the sustainability of development projects economically, socially, and environmentally. Projects are expected to avoid permanent negative impacts on the biosphere and ecosystems. To adhere to this principle, the project proponent should incorporate mitigation measures to reduce its impacts on the ecosystem. Participatory methods involving stakeholders should be utilized to inform them about potential environmental and social impacts and to develop sustainable solutions throughout the project's lifespan.

4.5.3. 2.4.3. The United Nations Convention on Biological Diversity (CBD)

The CBD, established in 1992, recognizes the importance of biological resources for economic and social development while acknowledging the threats to species and ecosystems. The convention aims to conserve biodiversity, promote its sustainable use, and ensure fair and equitable sharing of benefits. This includes introducing procedures for environmental impact assessment of proposed projects likely to affect biodiversity and considering the environmental consequences of policies and programs. The project in Meru Municipality must incorporate appropriate mitigation measures outlined in the ESMP to minimize negative impacts on biodiversity, including vegetation, habitats, and aquatic ecosystems.

5. PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATION

5.1. Overview

The Government of Kenya, as defined by the Constitution of 2010, the Environmental Management and Coordination Act (EMCA) of 1999, the Environmental (Impact and Audit) Regulations of 2003, and other pertinent legislation, underscores the importance of public participation in decision-making processes. AfDB Operational Safeguards emphasizes stakeholder consultations as vital components of project implementation.

In compliance with these requirements, the proposed project through the ESIA stakeholder engagement conducted public consultations to ensure community involvement and to gain insights into their perspectives, needs, and preferences. These public consultations served to gather valuable insights from the local community regarding the potential impacts of the project and to integrate their feedback into the project's final design and operation.

The main aim of the stakeholder engagement was to gather the community input and insights, which would then be utilized to inform the designs and implementation the project. The specific objectives of the consultation and public participation were to:

a. Create awareness among the public on the need for the ESIA and RAP for the proposed project
b. Gather comments, suggestions, and concerns of the interested and affected parties
c. Incorporate the information collected in the ESIA
d. Build community consensus and acceptance of the proposed project

5.2. Stakeholder Engagement Plan (SEP)

A Stakeholder Engagement Plan has been developed to outline a structured, informed, and inclusive approach for TWWDA to engage with stakeholders regularly throughout the project phases. The primary objectives of the SEP are:

- Establishing a systematic method for stakeholder engagement throughout the project lifecycle.
- Identifying key stakeholders impacted by the proposed projects, understanding their interests, concerns, and influence regarding project activities.
- Facilitating effective and inclusive engagement with project-affected individuals throughout the project cycle on matters that may affect them.
- Identifying efficient methods to disseminate project information based on stakeholders' needs.
- Ensuring timely and accessible disclosure of project information regarding environmental and social risks and impacts to stakeholders.
- Providing accessible and inclusive channels for project-affected parties to raise grievances, enabling project implementers to respond to and manage such grievances effectively

5.3. Stakeholder engagement methodology

The stakeholder engagement methods adopted for the last-mile connectivity of the Meru Sewerage Project involved a systematic approach to involving all relevant stakeholders in the planning, implementation, and monitoring of the project.

The consulting team in conjunction with the proponents at first conducted a stakeholder analysis to identify all individuals, groups, organizations, and institutions that may be affected by or have an interest in the project. All the stakeholders were categorised based on their level of influence, interest, and importance to the project.

A stakeholder map was developed to visualize the relationships between different stakeholders and their respective interests in the project. This culminated to determination of communication channels and mechanisms preferred by each stakeholder group. A variety of communication channels to engage with stakeholders, including community meetings, workshops, focus group discussions, oral interviews, questionnaires, surveys, and online platforms. All the communication channels were accessible, culturally appropriate, and inclusive to all stakeholders, including marginalized groups as much as possible.

5.4. Public Consultation Meeting

To gather input from important stakeholders, community and other parties potentially influenced or interested, several public consultation meetings were conducted. This meeting had the objective of engaging community members, interested parties, administrative authorities, crucial personnel from the County level, as well as ward representatives at different locations and days. The meetings have been summarised in the table below:

Table 5-1: Public Participation Meetings

DATE	VENUE	INTERESTED PERSONS	ATTENDANCE
28th, February 2024	DCC's Boardroom Meru	Community and the Public Administration	18 (10M, 8F)
29th, February 2024	Meru Municipal Hall	Community and PAP's	40 (18M, 22F)
7th, March 2024	Kinoru Stadium Hall	Municipality Business Community and the community	78 (40M, 38F)

The main aim of the meeting was to disseminate information about the proposed last mile connectivity of the Meru Sewerage project, highlighting both its expected impacts and advantages. The minutes of the meetings have been appended to this report.

5.4.1 Opinion on Project implementation

The responses received from attendants clearly indicate that the LMC sewerage project will play a crucial role in improving the sanitation and enhanced quality of life for the

people of Meru. All respondents expressed their interest in the project, recognizing its significance in the development of Meru and its positive impact on the overall economy, leading to sustainable livelihoods.

5.4.2 Comments and Salient Issues from the Meeting

The Proposed Last Mile Connectivity of the Meru Sewerage Project offers several benefits to the community, the environment, and the overall development of the municipality as outlined in the meetings conducted. Some of the benefits outlined include:

1. **Improved Sanitation and Public Health:** Last-mile connectivity ensures that more households and communities have access to proper sanitation facilities. This reduces the risk of waterborne diseases, improves public health, and enhances overall quality of life.

2. **Environmental Protection:** Proper sewerage systems prevent pollution of water bodies, soil, and air by safely disposing of sewage and wastewater. This helps to preserve the local ecosystem, protect biodiversity, and mitigate environmental degradation.

3. **Enhanced Quality of Life:** Access to reliable sewerage services shall contribute to a cleaner and healthier living environment within Meru municipality. It will reduce odours, pests, and contamination, creating a more pleasant and hygienic community for residents.

4. **Economic Development:** Improved sanitation infrastructure will stimulate economic growth by attracting investments, promoting tourism, and enhancing property values. It will also create job opportunities in construction, maintenance, and operation of sewerage systems.

5. **Social Equity and Inclusion:** The proposed Last-mile connectivity of the Meru Sewer will ensure that underserved communities, including low-income households and informal settlements, have equitable access to sanitation services. This will promote social inclusion and reduce disparities in access to essential services.

6. **Water Conservation:** Proper disposal of wastewater through sewerage systems will help to conserve freshwater resources by minimizing contamination and pollution. This will support sustainable water management practices and ensures access to clean water for future generations.

7. **Mitigation of Water Pollution:** By diverting sewage away from natural water sources, last-mile connectivity reduces the risk of water pollution, which can harm aquatic ecosystems, fisheries, and recreational areas. This contributes to the preservation of water quality and biodiversity.

8. **Compliance with Regulatory Standards:** The implementation of last-mile connectivity aligns with national and international standards for sanitation and

environmental protection, ensuring compliance with regulatory requirements and enhancing the project's sustainability.

9. **Long-Term Cost Savings:** While initial investment costs may be significant, the long-term benefits of last-mile connectivity, such as reduced healthcare expenses, increased productivity, and environmental conservation, outweigh the costs, resulting in overall cost savings for the community and government authorities.

Table 5-2: Issue Matrix from the Public Participation Meeting

Issue Raised	Technical Team Response
Compensation of the affected persons	• Unlike the ongoing sewer treatment plant that involved resettlement of people to pave way for construction the LMC project would utilise road reserves hence there will be minimal disturbance of the municipality people. • However, compensation for any person that will be directly affected by the projects shall be done diligently following the Resettlement Action plan that shall be formulated by the consultant.
Enquiry about if the local labour force would be prioritized	• In a bid to grow the economy of the project area, the contractor shall be keen on hiring locals, especially for unskilled labour.
How will the community get sewer services?	• The stakeholders were informed to liaise with MEWASS
What is the sustainability of the proposed project	• The sewer lines will be constructed durably with plastic PVC pipes which are long-lasting • Once the construction was done the project would be handed over to MEWASS who will be tasked with the operational and maintenance of the project infrastructure
Remedy for sewer leakages	• There will be a quick response from the MeWaSS operational and maintenance team.
• Inquiry if the scope of the project if it will cover parts of Rangaini, Milimani and Forest areas in the Municipality • When the proposed works will begin	• The areas were captured. They further explained the layout using the local dialect and the local names of areas to allow the community members understand the proposed layout better. • It was responded that they were not certain of how soon the proposed works would begin but explained that it will begin after the proponent has complied with all the financier and the national requirements
• The terms of compensation of the lost livelihoods • Will the project incorporate the existing sewer projects	• Compensation was based on how the proposed project had directly affected the livelihood of the person in regards to the wayleave. He explained that wherever a way leave will lead to demolition of property of destruction of crops and trees then it would compensated appropriately as per the outcome values

Issue Raised	Technical Team Response
which have been serving the town	of the RAP. A huge percentage of the sewer lines were designed to be on the road reserves • On the second question it was responded that the proposed project won't be incorporated with the previous sewer systems as the pipes are non-interoperable with the current systems. Furthermore, the sewer systems were built considering the gravitational flow of sewer to the Gakoromone Sewer Treatment plant which is scheduled for decommissioning. The new system was designed to gravitate the waste to the new Rwanyange Sewer treatment plant.
The previous road reserves were so narrow this would compromise the ways for the sewer lines getting into farms	• All the roads within Meru town were of standard with of 10 meters all accounting for the carriage way, footpath and drainage. It was addressed the members who had encroached the road reserves to quit as this would lead to demolitions. She recommended that TWWDA and KURA to engage to acquire the right of ways for pipelines within the reserve.
How TWWDA is planning to engage institutions where the lines were designed to pass	• The proposed layout doesn't pass through institutions however whenever they would be forced by the designs to pass through the institution TWWDA will follow requisite procedures to acquire wayleave through the institution's management. Dedicated sewer trunks have been designed primarily to serve big institutions in Meru including: KeMU, MUST, and Meru National Polytechnic
The proposed projects potentiality to disturb the water supply lines as previous projects terminated their water supply infrastructure	• The previous projects done by TWWDA had not tempered with the water supply lines. Whenever the pipeline was disturbed the agency through the Residential Engineer made efforts to repair the pipeline. He further responded that the project will have grievances readdress mechanism through which the community shall air out their concerns throughout the project implementation. The office responsible shall be situated at MeWaSS offices at the Water Treatment plant in Kinoru
Will the people neat the main sewer trunk be connected directly to the sewer system?	• It is not advisable to be connected to the sewer line directly via the main trunk as whenever the main trunk is tempered with it will lead to a sanitation calamity. The community members were advised that whenever they would need a connection to the sewer line, they would be connected through application to MeWaSS the WSP for Meru urban areas.
Proposed works impacts on road disruptions as previous works conducted	• The proposed works will ensure there is minimal inconveniences on the roads. There would be a dedicated marshal to ensure the roads are passable. The road crossings shall be executed through micro tunnelling minimising road cuttings

Issue Raised	Technical Team Response
by MeWaSS disrupted transportation	
Inquiry if Gitoro village was included in the proposed LMC sewer Project	• Based on the surveyed layout the village was not in the plan however the technical team assured that the village will be included in the future plans

5.4.3 Recommendations from the Meeting

- Based on the fact that the development of sewer trunks would disrupt the supply of water in the area. It is suggested that the proponent should consider undertaking the works in chronological phases that would minimise breakage of waterlines.
- The community urged that the contractor and the donor to engage in open discussions with them to proactively address any potential water supply issues that may arise during the construction phase due to pipe leakages. They emphasized the importance of ensuring that the construction activities do not exacerbate water scarcity in the area.
- The community members appeal that the chosen contractor should prioritize the employment of local youth whenever job openings arise during the project's duration.
- The community members recommended that the proponent should develop a structured format in which the members of the community can address their grievances to the project developers.

5.5. Public Consultation Questionnaires

ESIA questionnaires were administered, to gather information from key stakeholder and the members of the public. This was done using structured questionnaires to assess the environmental and socio-economic views of the respondents. A total of 30 questionnaires were administered in the project area. Samples of filled questionnaires administered in the project area are appended to this report.

5.6. Key Informant Interviews

One-on-one interviews were conducted during various meetings conducted by the experts. The interviews were conducted in the preferred language of the participants, with most local community members being interviewed in Kiswahili, and officials having the choice between Kiswahili and English based on their language proficiency. The stakeholders were provided with a project overview and objectives before sharing their opinions.

The key stakeholders who were interviewed for this project included individuals from different levels, such as community members, managers of key institutions, and business owners within the project environs. These stakeholders encompassed:

- Director of Water
- Director of Environment
- Ministry of lands

- Water Resources Authority
- Public Administration
- Public Health
- Meru Water and Sewerage Service
- Water Resource Users Association

5.7. The Grievance Redress Mechanism Structure

The GRM structure presents procedures and timeframes for grievance redress at various levels. Figure 1 presents the general steps for each grievance reported.

5.7.1. Grievance Management Procedure

All grievances reported shall be managed using the procedure illustrated in figure 5.1 below.

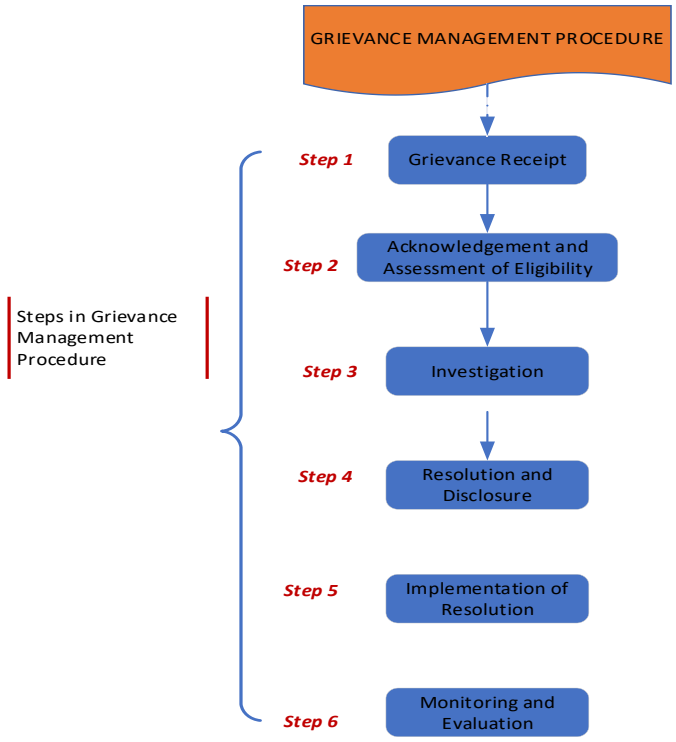


Figure 5-1:Steps in Grievance Readdress

A three-level redress mechanism targeting all stakeholders involved in project implementation will be adopted.

5.7.2. First Level of Redress: Community Level

The first level of grievance redress will be at the community level mainly targeting the local beneficiary communities and the project affected persons (PAPs). For every community at location level, a local grievance management committee shall be formed and trained to handle community grievances/ complaints emanating from the implementation of the proposed water supply and sanitation projects. The committee shall comprise of five

members who shall include the local chief as the chair. The other members shall be nominated by the project beneficiaries ensuring gender balance and a representation of the vulnerable where applicable.[1]. The committee shall be trained by the community liaison officer from the local water service provider (WSP) on conflict resolution, group dynamics, project sustainability among other areas that shall be deemed necessary.

Step 1: Receipt of grievances

The mode of receipt of the complaints/ grievances may either be in writing, reported verbally, over the phone or emails. Once the local grievance management committee receives a grievance, the committee secretary shall be mandated to register the grievance. The received grievance and relevant information related to the grievance shall be recorded on a standardized grievance register attached in appendix 1.

Step 2: Acknowledgement, assessment for eligibility and recording

The committee shall then determine the eligibility of the grievance received and if eligible, they shall notify the complainant and acknowledge receipt within three (3) days of receiving it. If not eligible, the complainant shall be informed of the reasons and advised on other existing GRMs to address his grievance. The complainant shall also be informed of the next steps and the timeframes including any further information/ documentation that maybe required to aid in investigation. The timeframes should not be later than twenty-one (21) days after the grievance is received.

Step 3: Investigation

The committee shall then set a day when all members are available and begin the investigation by assessing the seriousness/ severity of the grievance and classifying it either as high, medium, or low based on its impact to the complainant and the project. The assessment may necessitate the need for additional data collection through field visits to the sites, interviews with the relevant groups and follow up meetings with the affected groups to validate the information provided by the complainant. Minutes of such meetings shall be recorded and attached to the grievance report.

Step 4: Grievance Resolution and Disclosure

Depending on the findings and severity of the grievance, a resolution shall be decided immediately and the deliberations recorded in the grievance resolution form provided in the Appendix. However, if the grievance cannot be resolved by the local grievance management committee it shall be escalated to the county level and to the national level if not resolved at the county level. In cases where the complainant shall not be satisfied with the resolution given by the concerned committee, they shall be advised to report to the next level of redress. Also, in cases where the project GRM levels are unable to resolve the grievance, the complainant will be referred to the existing legal and judicial mechanisms in

[1] The committee should have at least two female members

Kenya. This process should take a maximum of thirty (30) days from the time the parties are informed of the acceptance of the grievance.

Step 5: Implementation of the Resolution Mechanism

Once a resolution has been determined and the same communicated to the affected parties, an agreement shall be drawn outlining the following among other strategies for settlement of the grievance:

- Requesting the relevant agencies/ contractors responsible for the grievance to take appropriate measures to address the root causes of the grievance
- Determining reasonable compensation for loss from the accused parties
- Signing agreements between the accused persons and the project for solutions mutually agreed upon

Step 6: Grievance monitoring

The local grievance management committee shall then monitor the implementation of the grievance resolution mechanisms given and assess any further impacts of the project related grievances. They shall also monitor to ensure that the redress is granted to complainant in a timely and efficient manner and give regular feedback to the complainants about the progress.

5.7.3. County Level

The second level of redress will be at the county level where a county grievance management committee shall be established and chaired by a nominee of the proponent, TWWDA. The membership of the committee shall entail a nominee from the water service providers (WSPs), community liaison officers from the WSPs and the chairs of the various local grievance management committees in the County. The committee will also be trained in handling project grievances.

Just like the case with the first level of redress, once a complaint has been registered, the county grievance management committee will set a day to investigate the same and offer an action/ solution. If possible, a meeting will be held between the complainants and the concerned project officer to find a solution. Similarly, like in the first level of redress, a grievance resolution form shall be filled providing details of how the grievance was investigated and the recommended action provided. The resolution period shall be expected to take a maximum of fourteen (14) working days after which the complainant shall be notified through a grievance disclosure form. Grievances that shall not be resolved at this level shall be referred to the next level.

The county grievance management committees shall be obligated to submit a quarterly report using the standardized format provided in Appendix 4. of registered complaints to Tana Water Works Development Agency, TWWDA.

5.7.4. Third Level of Redress: National Level

At the National Level, a Grievance Handling Committee shall be appointed and equally trained to handle grievances. The committee shall be chaired by a nominee at the Ministry of Water, Sanitation and Irrigation, other membership shall include the CEO TWWDA, the project co-ordinators at TWWDA, the chairs of the county grievance management committees and a representation from TWWDA legal department. The ministry shall appoint a grievance handling officer who shall foresee operations of the committee. As in other levels, the reporting tools for other levels shall equally apply at national level reporting.

The resolution period at national level shall be expected to take a maximum of twenty (21) working days and the concerned shall be notified through the GRM/003 form. Should the grievance not be solved within this period, the complainant shall be advised to seek recourse through the legal and judicial mechanisms in Kenya discussed below.

TWWDA shall maintain databases and reports on all grievances and regularly conduct an assessment of the overall effectiveness and the impact of the GRM. The results of the assessment shall be used to improve the performance of the GRM and provide valuable feedback to project management.

5.7.5. National Arbitration Processes in Kenya

In the event that the complainants are dissatisfied with the outcome of grievance resolution, they shall be advised to seek recourse through the following national arbitration processes:

i. Commission on Administrative Justice (CAJ)
ii. National Environment Tribunal (NET)
iii. Land Acquisition Tribunal
iv. Courts

Commission on Administrative Justice (CAJ)

The Commission on Administrative Justice (CAJ) also known as the Office of the Ombudsman is an independent commission established by the Commission on Administrative Justice Act, 2011 pursuant to Article 59 (4) of the Constitution of Kenya. It is the foremost constitutional commission whose primary function is to ensure public officers and public institutions respect sovereignty of the people of Kenya. The CAJ is mandated to address all forms of maladministration, promote good governance and efficient service delivery in the public sector by enforcing the right to fair administrative action. The CAJ investigates abuse of power, manifest injustice and unlawful, oppressive, unfair or unresponsive official conduct.

National Environment Tribunal

Tribunals are an integral component of the justice system in Kenya and play an important role in reducing pressure on courts and facilitating expeditious access to justice. The Constitution of Kenya, 2010 recognizes tribunals as part of subordinate courts in the judicial hierarchy hence demonstrating their importance in the administration of justice in

Kenya. The National Environment Tribunal (NET) is established under the Environmental Management and Co-Ordination Act (EMCA). The jurisdiction of the Tribunal is set out under section 125 of the Act. The Tribunal hears and determines appeals concerning: *grant of a license or permit or refusal to grant a license or permit; imposition of any condition, limitation or restriction on a license; revocation, suspension or variation of a license the amount of money required to be paid as fee under the Act or imposition against the person of an environmental restoration order or environmental improvement order by the Authority under the Act or its regulations*. The Act requires appeals to be lodged with the Tribunal within sixty days of the occurrence of the event which a person is dissatisfied with.8 In addition, the jurisdiction of the Tribunal extends to appeals against decisions of the Director General of the National Environment Management Authority (NEMA). All grievances related to project licensing by NEMA shall be referred to the National Environment Tribunal.

Land Acquisition Tribunal

The Land Act, 2012 was amended in 2019 to include Section 133A which provided for the establishment of a tribunal, the Land Acquisition Tribunal to hear and determine appeals from decisions of the National Land Commission in matters relating to the compulsory acquisition of land.

The jurisdiction of the Land Acquisition Tribunal is in respect of appeals from the decision of the National Land Commission (NLC) on matters compulsory acquisition, as per section 133C (1) of the Land Act. Further, section 133C (6) of the Land Act grants initial/first instance jurisdiction to the tribunal to deal with disputes on creation of wayleaves, easements, and public right of way. Also, as per section 133C (8) of the Land Act, the Land Acquisition Tribunal has the powers to uphold and enforce the Bill of Rights and review any administrative action as to compulsory acquisition. In summary, the LAT has jurisdiction on disputes regarding:

a. Compulsory acquisition of land
b. Wayleaves; easements; and public right of way
c. Upholding and enforcement of the Bill of Rights, as well as review of administrative action, as to compulsory acquisition

Even though, compulsory acquisition of land is not envisaged in this project, the role and provisions of the Land Acquisition Tribunal have been reviewed and provided as a precaution.

Courts

The Courts have power to hear and determine disputes, primarily of criminal and civil nature. Criminal cases are those in which the State prosecutes a person or an organization for committing an act which is not in the interest if the public, and therefore considered to be an offence against the state. Civil cases originate from a person who seeks redress for a private wrong such as breach of contract, trespass or negligence; or to enforce civil remedies such as compensation, damages or to stop some action.

Figure below presents a summary of the levels of grievance redress mechanism

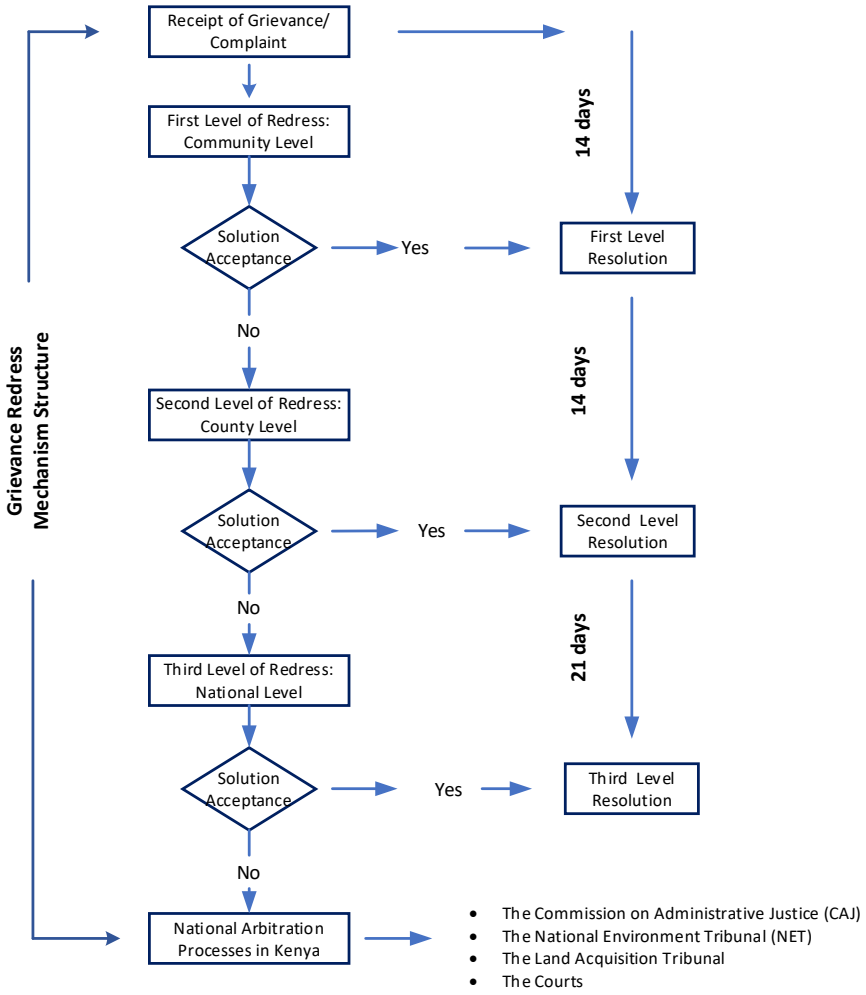


Figure 5-2:Levels of Grievance Redress Mechanism

6. ANALYSIS OF PROJECT ALTERNATIVES

6.1. Introduction

This section delves into alternative pathways for the proposed project, carefully weighing their potential environmental consequences. The objective is to appraise the advantages of the intended project against potential environmental drawbacks. The fundamental principle guiding the exploration of these alternatives is to secure a choice that delivers the utmost social, environmental, and economic advantages. This choice should extend its benefits not only to the project initiator but also to the surrounding environment and local stakeholders.

As mandated by the National Environmental Management Authority), this section assumes a pivotal role in shaping the most fitting development approach while minimizing any disruptive impact on the environment. To achieve this, an exhaustive analysis was be conducted on a range of feasible land-use options. These options were subject to rigorous assessment criteria, encompassing their environmental implications, acceptance within the community, economic viability (including land productivity), and feasibility in terms of design and execution.

6.2. "No-action" Alternative

6.2.1 Evaluation

The "No-action" alternative means maintaining the current status quo of no LMC project in project area. This option would ensure preservation of the environment with the existing vegetation and ecosystem without introducing any changes. The decision to select this alternative could stem from various principles, including:

- **Environmental Sensitivity**: If the site hosts threatened, rare, endangered, endemic, or keystone plant or animal species, or if it holds a designation for preservation under legislative acts.
- **Archaeological or Historical Significance**: If the site contains valuable historical or archaeological artifacts or holds substantial cultural importance.
- **Environmental Implications**: If implementing the project would lead to significant and adverse environmental impacts.

Opting for the "No-action" alternative safeguards the site's environmental sensitivity, historical or archaeological value, and averts potential negative environmental consequences linked to the proposed project.

6.2.2 Findings

The Last mile Connectivity of the Meru Sewerage project will not hinder or obstruct existing or future developments in the vicinity, including the presence of similar developments. The last mile connectivity is a continuation of the first phase of the Meru

Sewerage project where the treatment plant and the main trunks were laid. The Last Mile Connectivity aims at connecting the consumer/resident to the sewer system

Thorough evaluation reveals no significant concerns regarding the physical, biological, cultural, and socio-economic attributes of the municipality or its vicinity. This implies that the project is not expected to exert adverse effects on crucial aspects related to the physical environment, biodiversity, cultural heritage, or local communities.

Fundamentally, this option is the most unsuitable alternative as the environmental and economic benefits expected from the project will not be realized. The proposed last mile connectivity for the Meru Sewerage project is anticipated to offer a continuous and sufficient sanitation services within Meru municipality. It is anticipated that the project will seamlessly integrate with established developments, displaying nominal environmental repercussions and inconsequential apprehensions concerning the area's physical, biological, cultural, and socio-economic dimensions.

6.2.3 Implications

The "No-action" alternative will compromise sanitation services for the people of Meru. The residents within the municipality will continue using the old systems with its inefficiencies while the new systems would be rendered useless. There would be a continuous pressure on the present waste water treatment plant in Gakeremoni leading to inefficiencies that would compromise ecosystems downstream. The community members would continue enduring from water borne illnesses due to the consumption of polluted water extracted from the inadequate sewer systems in Meru, further exacerbating their health challenges.

6.3. Relocation Alternative

6.3.1 Evaluation

This alternative involves the relocation of the proposed project to an alternative site. Should this option be selected, the proponent would need to identify a new site either within or outside the designated zone. The rationale for considering this alternative might be guided by the following considerations concerning the proposed development:

- **Conflict with Existing Development**: The project could hinder the progress of an already established development.
- **Incompatibility**: The project might be incongruent with other ongoing or planned developments in the vicinity.
- **Ecological Sensitivity**: Similar to the "no-development" alternative, the project site could lie in an ecologically sensitive area.

6.3.2 Findings

The proposed development does not obstruct or deter the continuation of other projects in the future. The projects form a fundamental consideration for future developments

within the municipality. The pipe routes have been adequately surveyed to ensure they don't compromise the sensitive ecosystems including wetlands and forests. Given that the present sewer system does not meet the current and future demand for sanitation then the need for the project surpasses that of any other commodity. With an average connection to 160,000 people the necessity for reliable sanitation service is paramount within the municipality.

6.3.3 Implications

Choosing a different route for the sewer trunks would diminish the project's ability to benefit the intended Meru people within the municipality. The project aims at increasing access to sewerage services by the residents in Meru. The sewer has been designed to to flow using the conventional gravitational system where it's expected to flow with gravity to the treatment plant. Changes to the pipelines would lead to additional pumping charges and development of discharge bays for the sewer trucks disposal.

Akin to the "no-action" alternative relocation option, would incur additional financial charges and losses due to the investments already committed to project design and planning. Furthermore, the process of surveying and identifying a new location is time-intensive. Even if a suitable site is found, there's a possibility that its costs might surpass the project's financial capacity, rendering it unaffordable.

6.4. Alternative Waste Water Infrastructure

Having a sustainable infrastructure is essential because it directly affects all measures of sustainable development. As it is essential for every society and its economy, the sewage infrastructure system is a critical component in meeting the sustainable development goals. Furthermore, having a sustainable infrastructure can accelerate the balance of the economic, social, and environmental aspects of sustainable development.

Some of the alternative infrastructure to the proposed LMC for Meru sewerage are outlined below:

6.4.1 Septic Systems:

Septic systems are individual wastewater treatment systems which consist of a septic tank and a drain field. Wastewater from the household flows into the septic tank, where solids settle and are partially decomposed by bacteria. The liquid effluent then flows into the drain field, where it percolates through the soil, undergoing further treatment before returning to the groundwater.

The infrastructure only works in small scale, developing it for a large-scale purpose in situations like Meru municipality might not efficiently work. The inefficiencies brought to the environmental might be so expensive to mitigate.

6.4.2 On-Site Treatment and Reuse Systems:

On-site treatment and reuse systems treat wastewater on-site and reuse it for beneficial purposes. These systems include advanced treatment technologies such as membrane bioreactors, ultraviolet disinfection, and reverse osmosis. Treated wastewater can be reused for irrigation, industrial processes, toilet flushing, and groundwater recharge.
The onsite treatment systems may not be feasible for municipal and communal use as it I would incur a lot of costs to manage infrastructure at different locations. The systems require a lot of input from individuals which may not work for the proposed project.

6.4.3 Vacuum Sewer Systems:

Vacuum sewer systems use vacuum pumps to transport wastewater through underground pipes to a central collection point. Vacuum sewer systems are particularly suitable for areas with difficult terrain or low population density. They require smaller pipes and shallower excavation compared to traditional gravity sewer systems.

The vacuum sewer systems would work in stances where there are difficult terrains in contrary to the proposed LMC where the treatment unit was set at the lower side of the municipality in Rwanyange where the sewer will be conveyed by gravity. The vacuum sewer systems require a higher initial capital cost compared to gravity sewer systems in addition dependence on vacuum pumps for wastewater transport, requiring backup power systems in cases of blackouts rendering it unsustainable.

6.4.4 Decentralized Treatment Systems

Decentralized treatment systems consist of smaller-scale treatment facilities distributed throughout a community or neighbourhood. These systems can include packaged treatment plants, decentralized membrane bioreactors, and small-scale activated sludge systems. Decentralized treatment systems provide flexibility, redundancy, and resilience to the overall wastewater management infrastructure

This would require that the proponent develops several decentralised systems to satidsfy the needs of the entire municipality. The decentralised infrastructure may require higher maintenance and operational costs compared to centralized systems. With also limited capacity for treating large volumes of wastewater as it is in the municipality. The system is prone to potential odour and aesthetic issues if not properly managed.

6.4.5 Implementation of the Sewer system as it is in the ESIA

Implementation of the proposed last mile connectivity of the Meru Sewerage project as it is in the design would create a more efficient system for collection and disposal of waste water from various targeted estates. This will alleviate sanitation problems particularly in peri urban areas and provide employment opportunities to locals during construction and operational phase. Even though some negative impacts such as noise, soil and water contamination associated with such a development maybe experienced, these negative impacts can be mitigated through various measures proposed in the Environmental and Social Management Plan (ESMP).

7. ANTICIPATED IMPACTS AND MITIGATION MEASURES

7.1. Introduction

This chapter presents the assessment of the issues likely to arise as a result of implementation of the proposed project. The impacts are presented in-regard to their likelihood of occurrence on the physical, biological, occupational and socio-economic environments.

7.2. Expected Positive Environmental and Social Impacts During the Construction Phase

Job Opportunities: The construction phase of the project will create job opportunities, particularly for casual workers. Many individuals, including casual laborers, masons, carpenters, joiners, electricians, and plumbers, will be employed on-site throughout the project's duration, from start to finish. In addition to casual laborers, formal employees including engineers, surveyors and planners will also have the opportunity to secure employment during the construction period

Economic Stimulus: The influx of workers and construction activities will stimulate economic growth in the area. Local businesses, including suppliers of construction materials, equipment rentals, and catering services, may experience increased demand, leading to business expansion and increased revenue.

Infrastructure Improvement: The construction of sewerage infrastructure will come in with auxiliary infrastructure needed to support the implementation of the sewer project. Project construction phase will require good access roads to the project site, enough water to cater for the construction activities and lighting to ensure security. These additional infrastructural activities will not only benefit the project but also the entire community surrounding it.

Community Development: The construction phase provides an opportunity for community engagement and participation. Local communities can be involved in various aspects of the project, such as awareness campaigns, skills training programs, and environmental conservation initiatives, fostering a sense of ownership and empowerment.

7.3. Negative Impacts During Construction

7.3.1 Loss of Biodiversity and Habitat Destruction

The excavation for sewer pipelines and drainages would compromise some existing vegetation, particularly shrubs. However, the overall impact on the ecosystem is expected to be minimal since there is an existing project in place. Currently, the road reserves through which the pipelines shall be developed has limited vegetation, mainly consisting of grass and a few trees.

Mitigation measures

- Tress of cultural and environmental importance shall be avoided by all means possible

- Where possible the contractor to exercise selective removal of mature, indigenous trees and vegetation
- Any area around the project site that will not be used for construction purposes will be restored and landscaped to the original state with addition of aesthetic beauty by planting indigenous trees

7.3.2 Disturbance of utilities

Excavation for sewer pipelines may require the relocation or disturbance of existing underground utilities such as water pipes, gas lines, and electrical cables. Accidental damage to utilities can disrupt essential services, pose safety risks, and lead to costly repairs. However, the construction process, involving excavation of trunk lines and disturbance of existing piping systems raises concerns about potential disruptions to the overall water supply for the municipality. This will require careful planning and implementation of various measures including:

1. Use non-destructive excavation techniques such as vacuum excavation or ground-penetrating radar to minimize the risk of damaging existing utilities.

2. Road pavements and drainage systems to be affected, should be restored by the contractor within the shortest time possible

3. Coordinate with utility providers to relocate or protect underground infrastructure as needed to accommodate sewer line construction.

4. Prior to construction, the proponents and contractor should establish temporary alternative water supply sources for the residents. This could involve using water tankers to ensure a continuous supply of water during construction.

5. Divide the construction process into phases to minimize the area of disturbance at any given time. This will reduce the extent of disruption to the water source and allow portions of the water supply to remain unaffected.

6. Implement controlled excavation techniques to minimize the disturbance to the surrounding pipes This could include measures like using proper equipment, controlling digging depths, and limiting the amount of loose soil exposed at once.

7. The proponent and the contractor shall involve the local community in the planning and execution of construction activities. Their input and observations can help identify potential issues and facilitate collaborative problem-solving.

7.3.3 Public Health and safety Concerns

The development of the sewer lines will involve digging of deep trenches which could form potential hazards to humans and animals. The movement of construction materials may result in accidents if good supervision is not provided. Accidental cuts and bruises are common among construction workers as a result of the use of machinery and hand tools, an impact that needs due consideration. Similarly, flammable liquids such as fuels and

lubricants will be stored at the site for use in small construction equipment. Leakage or spillage of such substances may result into fires that may cause considerable losses in terms of injury to persons and damage to property.

To ensure safety and emergency preparedness during the construction phase, the following measures will be implemented:

- Site Protection: Hoarding will restrict access to the sensitive construction sites, preventing unauthorized entry and accidents.
- The open trenches excavated shall always be covered at all times whenever possible if not a reflective barricade shall be done to prevent unprecedented entry
- Warning Signs: Clear signage to warn the public of construction hazards, shall be erected at points of work hence promoting safety awareness.
- Personal Protective Gear: Workers will be provided with appropriate protective gear such as helmets, goggles, gloves, and safety shoes.
- First Aid Training and Kit: Workers will receive first aid training, and a first-aid kit will be available on-site for prompt treatment of injuries.
- Incident Recording: A register will track injuries, near misses, and safety incidents, facilitating analysis for improvement.
- Safe Driving Instructions: Delivery drivers will be instructed to drive safely, especially near settlements, to prevent accidents.
- Contingency Plan: A plan will outline procedures for accident response, ensuring a coordinated and timely response.
- Emergency Contacts: Contact information for emergency services will be readily available on-site for quick access

7.3.4 Traffic Congestion

The Sewer development project will involve excavation, trenching, and installation of underground pipes, which can disrupt traffic flow and require road closures, lane restrictions, or detours. Construction vehicles and equipment may occupy lanes or block access to roads, leading to congestion and delays for motorists. The construction crews may need to temporarily close roads or divert traffic to alternative routes to facilitate sewer line installation work. These closures and diversions can reroute traffic onto already congested roads, increasing travel times and causing gridlock in surrounding areas.

Mitigation measures to address traffic congestion during sewer development shall include:

- Planning construction activities to minimize disruption during peak travel times or major events can help reduce traffic congestion.

- Implementing effective traffic management plans, including temporary traffic control measures, signage, and flagging operations, can help maintain traffic flow and minimize delays.

- Providing information to motorists about alternative routes and detours can help distribute traffic away from congested areas and reduce the impact on surrounding road networks.

- Engaging with the community and stakeholders through public outreach and communication campaigns can raise awareness about construction-related traffic impacts and encourage cooperation and understanding during the project.

- Collaborating with local transportation agencies and authorities to coordinate construction schedules, traffic management strategies, and public transit options can optimize traffic flow and minimize disruption to commuters and residents.

7.3.5 Solid Waste Generation

During the development of sewer lines, solid waste generation will occur due to various construction activities. Some common sources of solid waste during sewer line development include:

a) Excavation and Earthworks: Excavation of trenches for laying sewer pipes generates soil, rocks, and other debris as solid waste.
b) Construction Debris: Construction activities such as demolition of existing structures, clearing of vegetation, and installation of manholes and pipe fittings can generate construction debris, including wood, concrete, asphalt, and metal materials.
c) Packaging Materials: Packaging materials from construction materials such as pipes, fittings, and equipment can contribute to solid waste generation.
d) Spoils from Pipe Installation: Spoils, consisting of excavated material from trenching and boring operations, are generated during the installation of sewer pipes.
e) Land Clearing Waste: Clearing land for the construction of access roads, staging areas, and construction sites can generate vegetative waste, including branches, stumps, and roots.

- Contaminated Soil: Soil contaminated with petroleum products, chemicals, or other hazardous substances may be generated during site preparation and excavation activities.

Mitigation measures to manage solid waste during sewer line development include:

- Waste Minimization: Implement measures to minimize waste generation, such as optimizing pipe lengths to reduce offcuts, reusing salvaged materials, and selecting construction methods that minimize excavation.
- Segregation and Recycling: Segregate construction waste at the source and prioritize recycling of materials such as concrete, metal, and asphalt. Establish recycling facilities on-site or partner with local recycling centers to divert recyclable materials from landfill disposal.
- Proper Disposal: Ensure proper disposal of non-recyclable waste by transporting it to approved landfill facilities. Implement waste management plans that specify

procedures for waste collection, transportation, and disposal in compliance with local regulations.

- Hazardous Waste Management: Identify and segregate hazardous waste streams, such as contaminated soil or construction chemicals, and handle them according to applicable hazardous waste regulations. Dispose of hazardous waste through licensed contractors or treatment facilities.
- Monitoring and Compliance: Monitor solid waste generation and disposal activities throughout the construction process to ensure compliance with waste management plans and regulatory requirements. Conduct regular inspections and audits to identify and address any non-compliance issues.: -
- Waste Management Plan: the proponent has a comprehensive waste management plan that outlines procedures for waste reduction, segregation, recycling, and proper disposal. This plan shall be communicated to all project stakeholders, including contractors and workers.
- Waste Segregation: On-site source separation of different types of waste, such as construction debris, packaging materials, and hazardous substances by providing clearly labelled sites or containers for easy segregation.
- Material Reuse and Recycling: the proponent and contractor shall ensure materials on site are reused and recycled and disposal as the last option to minimize the amount of waste generated. Wastes such as excavated soil will be utilized on site to adjust levels where necessary and the rest disposed in authorized disposal sites.
- Waste Minimization Techniques: Durable long- lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time will be adopted over the project phase. Such construction practices minimize waste generation. This includes accurate material estimation, careful cutting and fitting, and efficient use of resources to avoid excess waste. Perishable construction materials such as paints shall be purchased incrementally to ensure reduced spoilage of unused materials. In addition, the excavation will be done according to the planned work and designs to minimize on debris
- Training and Awareness: it encompasses provision training and awareness programs to construction workers and contractors on proper waste management practices. Emphasize the importance of waste reduction, segregation, and recycling, and provide clear instructions on waste handling procedures. This shall be achieved through the daily toolbox talks on site.
- Construction Site Clean-up: the contractor shall implement regular clean-up routines to keep the construction site clean and organized. Waste and debris shall always be removed promptly to prevent accumulation and potential environmental contamination.
- Hazardous Waste Management: The contractor shall establish protocols for the proper handling, storage, and disposal of hazardous substances, such as paints, solvents, chemicals, and batteries. This shall be done in compliance with hazardous waste management regulations and engagement licensed waste disposal services when necessary.

- Collaboration with Waste Management Services: The contractor shall collaborate with licensed local waste management services and facilities to ensure proper disposal and recycling of construction waste.
- Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste

7.3.6 Air pollution

The potential sources of air pollution include traffic; emission from excavator and material supply vehicles. Movement of vehicles transporting material such as fuel and other required construction materials and equipment during construction will lead to the generation of dust in the air. Large quantities of dust present a respiratory hazard, it may also cause visual intrusion hence presenting accident risks during the construction phase.

To mitigate emissions during the construction phase, the following measures will be implemented:

- Watering of Construction Areas: Active construction areas will be watered as necessary to reduce dust emissions. This helps to suppress dust particles and prevent them from becoming airborne.
- Covering of Trucks: All trucks hauling loose materials will be covered, or a minimum of two feet of freeboard will be required. This measure prevents the materials from being exposed and reduces the potential for dust generation during transportation.
- Phased Project Implementation: The project will be undertaken in phases to mitigate the cumulative effects of dust. By staggering the construction activities, the overall dust emissions can be reduced compared to completing the entire project at once.
- Machinery Maintenance: Suitable maintenance will be carried out on all machinery used during construction to prevent the emission of noxious gases. Regular servicing and maintenance help ensure that equipment operates efficiently and minimizes emissions.
- Avoid Unnecessary Running of Engines: Drivers and machine operators will be instructed to avoid unnecessary running of motor vehicle engines and machinery when not in use. This practice reduces unnecessary emissions and conserves fuel.
- Wet Methods for Dust Suppression: Wet methods, such as water sprays and mists, will be used as dust suppression measures. These methods help to dampen dust particles, preventing them from becoming airborne.
- Provision of Personal Protective Equipment (PPE): Suitable PPE, such as nose masks, will be provided to workers and staff on-site to protect them from inhaling dust particles and ensure their safety.

7.3.7 Water Pollution

Water pollution during the construction of sewer lines can occur due to various activities and processes associated with the installation, excavation, of sewer infrastructure. Some of the potential sources and impacts of water pollution during sewer line construction will include:

1. **Silt and Construction Debris:** Sediment and construction debris, including concrete, asphalt, and metal fragments, can be washed into stormwater drains and creeks during rainfall events, contributing to water pollution.

2. **Bacterial Contamination:** If not properly managed, sewage spills or leaks from construction activities can introduce harmful bacteria and pathogens into surface and groundwater sources, posing risks to public health and aquatic ecosystems.

Mitigation measures to prevent water pollution during the development of sewer lines in Meru include:

1. **Erosion and Sediment Control:** Implement erosion and sediment control measures such as silt fences, erosion blankets, and sediment traps to prevent soil erosion and sediment runoff from construction sites. These measures help contain sediment and prevent it from entering nearby water bodies.

2. **Siltation Basins:** Construct siltation basins or sedimentation ponds at strategic locations to capture sediment-laden runoff from construction activities. These basins allow sediment to settle out of the water before it is discharged into stormwater drains or waterways.

3. **Vegetative Buffer Strips:** Establish vegetative buffer strips along watercourses and drainage channels to help filter and trap sediment and pollutants before they reach surface waters. Planting native vegetation helps stabilize soils and reduce erosion.

4. **Stormwater Management:** Implement stormwater management practices such as detention ponds, vegetated swales, and permeable pavements to capture and treat runoff from construction sites before it is discharged into water bodies. These practices help remove pollutants and reduce the volume and velocity of runoff.

5. **Spill Prevention and Response:** Develop spill prevention and response plans to minimize the risk of sewage spills or leaks during construction activities. Provide spill containment kits and training for workers to respond quickly and effectively to any spills that occur, minimizing the potential for water contamination.

6. **Water Quality Monitoring:** Conduct regular water quality monitoring to assess the impact of construction activities on nearby water bodies. Monitor parameters such as turbidity, pH, dissolved oxygen, and bacterial contamination to ensure compliance with water quality standards and regulations.

- Collection of Oils and Greases: Oils and greases resulting from repair and maintenance activities will be collected in designated containers to prevent their release into the environment.

- Proper Waste Management: Waste from sanitation facilities will be collected and transported by a licensed waste transporter to ensure proper disposal and prevent contamination of water sources.

- Compliance with the Water Act 2016 and the Water Quality Regulations.

7.3.8 Noise and vibration generation

Heavy machinery including excavators, backhoes, bulldozers, and jackhammers shall be used in sewer line construction. These machines generate high levels of noise, particularly during excavation, trenching, and breaking of concrete or asphalt surfaces. may be affected by occasional noise from these activities, it can be managed within acceptable limits. The significance of noise impacts depends on whether the project would introduce new sources of noise that would increase noise levels above the existing ambient levels. Noise impacts would be considered significant if the project results in the following:

- Exceeding the noise standards established in the local general plan or noise ordinance, or standards set in the EMCA (Noise regulations 2009), thus exposing individuals to excessive noise levels or generating such levels.
- Exposing individuals to excessive ground-borne vibrations or noise levels.
- Causing a substantial permanent increase (more than five decibels, dBA) in ambient noise levels in the immediate vicinity of the project, compared to levels without the project.
- Causing a substantial temporary or periodic increase in ambient noise levels in the project vicinity compared to levels without the project.

The permissible noise limits set for the project include:

- A continuous equivalent noise level of 90 dB(A) over an 8-hour period within a 24-hour duration.
- A peak sound level of 140 dB(A) at any given time.
- Noise transmitted from the workplace should not exceed 55 dB(A) during the day and 45 dB(A) during the night.
- Individuals working in areas with noise exposure are required to undergo regular audiometric examinations and internal examinations. These examinations include pre-employment and annual assessments to identify cases of deafness or hearing loss. Specifically, a deterioration of hearing loss of 20 dB(A) or more in two successive examinations within two weeks is considered significant.

The noise limits specified for the project are a maximum continuous equivalent of 90 dB(A) over 8 hours, a peak sound level of 140 dB(A), and restrictions on transmitted noise levels during the day and night. Additionally, regular audiometric and internal examinations are mandated for individuals exposed to noise, with a focus on detecting significant hearing loss.

Mitigation Measures

- Construction activities that generate significant noise can be scheduled during daytime hours when the impact on nearby residents is expected to be lower. Avoiding construction activities during early morning, late evening, and night hours can help reduce disturbance.
- Utilize construction machinery and equipment that are designed to produce less noise. Modern construction equipment often comes with noise-reducing features and technologies that can help minimize noise emissions.

- Noise Barriers and Enclosures: Install temporary noise barriers or enclosures around construction sites to contain and reduce noise levels. These barriers can be made of sound-absorbing materials like plywood, acoustic panels, or fabric, effectively mitigating noise propagation to surrounding areas.
- Noise-Reducing Techniques: Implement noise-reducing construction techniques, such as dampening the impact of machinery with rubberized pads, using mufflers or silencers on equipment exhausts, and employing low-noise construction methods wherever possible.
- Community Outreach and Communication: Maintain open communication with nearby residents and stakeholders throughout the construction process. Provide advance notice of upcoming construction activities, explain the measures being taken to mitigate noise pollution, and address any concerns or complaints promptly.
- Adhere to the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding noise limits at the workplace. Adhering to local noise regulations and guidelines is crucial. Ensuring that noise levels generated by construction activities remain within acceptable limits set by local authorities.

7.3.9 Disturbance of Enterprises

The construction activities associated with last-mile sewer connectivity, including excavation, trenching, and installation of sewer lines, will disrupt regular business operations within Meru town, Road closures, traffic diversions, and noise pollution can impact accessibility to commercial establishments, leading to decreased foot traffic and sales.

Road closures or restricted access to businesses due to construction activities can deter customers from visiting retail shops, restaurants, or service providers located in affected areas. Limited access to businesses can result in a decline in customer patronage and revenue loss for enterprises.

Accidental damage to infrastructure, such as underground utilities or adjacent properties, during sewer line installation can disrupt services and operations for nearby enterprises. Repairing damaged infrastructure may require additional time and resources, causing further inconvenience to businesses.

Mitigation measures to minimize the disturbance to enterprises during last-mile sewer connectivity projects shall include:

- The proponent to maintain regular communication with affected businesses to provide updates on construction schedules, anticipated disruptions, and mitigation measures. Coordinate construction activities to minimize impact on business operations.

- The contractor and the proponent to seek alternative access routes or pedestrian pathways to businesses affected by road closures or construction activities. The

contractor to provide clear signage and directions to ensure customers can easily navigate to their intended destinations.

- The contractor to schedule construction activities during off-peak hours or non-business hours whenever possible to minimize disruption to enterprises. Limit noisy or disruptive activities during times when businesses are most active.

- The proponent to offer financial assistance or compensation to businesses experiencing significant revenue loss or damages due to construction-related disruptions.

7.3.10 Sexual Exploitation and Abuse

The impact refers to situations where individuals, particularly workers, are subjected to sexual harassment, abuse, coercion, or exploitation in the context of their employment on LMC sewer construction sites. The exploitation occurs due to various factors, including power imbalances, inadequate policies and safeguards, and a lack of awareness or accountability. The forms of Sexual Exploitation include**:**

- **Harassment:** Verbal, physical, or psychological harassment, including unwanted advances, suggestive comments, or inappropriate touching, creates a hostile or intimidating work environment.
- **Coercion:** Workers may be coerced into engaging in sexual activities or relationships in exchange for job opportunities, promotions, or other benefits.
- **Abuse of Power:** Those in positions of authority, such as supervisors or contractors, may abuse their power to exploit or manipulate vulnerable workers for sexual purposes.

Mitigation Measures:

- The proponent shall establish clear policies prohibiting sexual harassment and exploitation in the workplace and ensure that workers are aware of their rights and avenues for reporting.
- The contractor to provide comprehensive training to all workers, supervisors, and management on preventing sexual exploitation and creating a safe and respectful work environment.
- The proponent and the contractor to implement confidential and accessible complaint mechanisms for reporting incidents of sexual exploitation, ensuring that victims can seek assistance without fear of reprisal.
- The contractor and proponent to provide victims of sexual exploitation with access to medical care, counselling, legal assistance, and other support services to address their immediate needs and facilitate their recovery.

7.3.11 Increased Crime

The construction project will attract a transient workforce to the area. This influx of workers, who may not have ties to the community and are often away from their families for extended periods, can lead to temporary spikes in crime rates.

The construction site contains valuable equipment, machinery, and materials, making them attractive targets for theft and vandalism. Criminal elements may exploit lax security measures or unsupervised areas to steal tools, wirings, or other valuable items. Alongside construction workers, the presence of contractors, subcontractors, and other personnel associated with the project can contribute to a transient population in the area. Transient populations are often less invested in the community's well-being and may be less inclined to follow social norms and steal from local residents

Mitigation:

- Foster positive relationships between construction teams and the local community through regular communication, outreach programs, and community meetings.
- Collaborate with local police and public administration to address security concerns and deploy resources effectively. Joint patrols, crime prevention initiatives, and information-sharing mechanisms can enhance safety and security in construction zones.
- The contractor to provide employment opportunities for local residents in construction-related roles, thereby reducing reliance on transient labour and fostering a sense of ownership and investment in the project's success.
- Educate community members about crime prevention strategies, the importance of reporting suspicious activity, and available support services.

7.3.12 Project Related Conflicts

During the construction phase of the project, conflicts may arise from various stakeholders, including the local community, project beneficiaries, and contractor workers. These conflicts can stem from factors including land acquisition, environmental concerns, labour issues, and disruptions to daily life. To address these conflicts effectively, a Grievance Redress Mechanism for the project has been developed with a log attached to the report in the appendix section.

7.4. The Anticipated Positive Impacts During Operation Phase

1. **Improved Sanitation and Public Health:** Last-mile connectivity will ensure that more households and communities have access to proper sanitation facilities. This will reduce the risk of waterborne diseases, improves public health, and enhances overall quality of life.

2. **Environmental Protection:** Proper sewerage systems prevent pollution of water bodies, soil, and air by safely disposing of sewage and wastewater. This helps to preserve the local ecosystem, protect biodiversity, and mitigate environmental degradation.

3. **Enhanced Quality of Life:** Access to reliable sewerage services shall contribute to a cleaner and healthier living environment within Meru municipality. It will reduce odours, pests, and contamination, creating a more pleasant and hygienic community for residents.

4. **Economic Development:** Improved sanitation infrastructure will stimulate economic growth by attracting investments, promoting tourism, and enhancing property values. It will also create job opportunities in construction, maintenance, and operation of sewerage systems.

5. **Social Equity and Inclusion:** The proposed Last-mile connectivity of the Meru Sewer will ensure that underserved communities, including low-income households and informal settlements, have equitable access to sanitation services. This will promote social inclusion and reduce disparities in access to essential services.

6. **Water Conservation:** Proper disposal of wastewater through sewerage systems will help to conserve freshwater resources by minimizing contamination and pollution. This will support sustainable water management practices and ensures access to clean water for future generations.

7. **Mitigation of Water Pollution:** By diverting sewage away from natural water sources, last-mile connectivity reduces the risk of water pollution, which can harm aquatic ecosystems, fisheries, and recreational areas. This contributes to the preservation of water quality and biodiversity.

8. **Compliance with Regulatory Standards:** The implementation of last-mile connectivity aligns with national and international standards for sanitation and environmental protection, ensuring compliance with regulatory requirements and enhancing the project's sustainability.

9. **Long-Term Cost Savings:** While initial investment costs may be significant, the long-term benefits of last-mile connectivity, such as reduced healthcare expenses, increased productivity, and environmental conservation, outweigh the costs, resulting in overall cost savings for the community and government authorities.

7.5. Negative Impacts During Operation Phase

7.5.1 Water Pollution

The Sewerage systems can lead to discharge of untreated or partially treated wastewater into water bodies. This can be brought by instances of increased pressure on the waste treatment plant through the increased user brought by the LMC. This can lead to contamination of surface water, groundwater, and soil, adversely affecting aquatic ecosystems and biodiversity.

Mitigation Measures:

- Implement advanced treatment technologies to remove a broader range of pollutants.
- Enhance monitoring and enforcement of discharge permits to ensure compliance with water quality standards.
- Invest in green infrastructure solutions like constructed wetlands or vegetated buffers to naturally filter and treat wastewater before it enters water bodies.
- Adhere to the provisions of EMCA (Water quality Regulations)

7.5.2 Spread of Water borne diseases

Over time, sewerage systems may experience deterioration and structural failures due to factors such as aging infrastructure, corrosion, and inadequate maintenance. Sewer line leaks, pipe bursts, and sewer collapses can result in sewage spills, property damage, and service disruptions. The poorly maintained sewerage systems can pose significant public health risks by spreading waterborne diseases such as cholera, typhoid, and hepatitis. Untreated sewage can contaminate drinking water sources, leading to outbreaks of waterborne illnesses among communities.

Mitigation Measures

- The managing team should ensure that all sewage undergoes proper treatment before discharge into water bodies.
- The WSP to conduct routine monitoring and testing of wastewater to assess its quality and ensure compliance with water quality standards for timely corrective actions.
- MeWaSS should invest in the maintenance, and upgrading of sewerage infrastructure that improve efficiency including sewage treatment plants and sewer lines.
- The Water Service Provider should develop and implement emergency response plans to address sewage spills, leaks, or other incidents that may pose a risk to public health.

7.5.3 Ecological Changes

The increased accumulation of sewerage waste in Rwanyange area can stimulate changes in the ecosystem. The development of sewerage systems would attract other species while it displaces others. This would lead to sudden changes in the ecosystem which may pose a threat to livelihoods.

Mitigation Measures:

- Conduct thorough Biodiversity Assessment prior to construction to identify and minimize impacts on sensitive habitats.
- Continuously monitor the effluent chemical composition
- Develop an efficient Effluent discharge Plan
- Adhere to the biodiversity management plan

- Implement measures to minimize land disturbance and habitat loss during operation.
- Implement habitat restoration or creation projects to offset any unavoidable habitat loss.

7.5.4 Odor and Aesthetic Issues:

Sewerage systems particularly at the treatment interface will generate potential unpleasant odors and visual pollution, especially whenever inadequate wastewater treatment is done. The presence of foul odors and unsightly sewage discharges can negatively impact the quality of life for nearby residents and visitors, as well as deter potential investors and tourists.

Mitigation

- Implement odour control technologies such as activated carbon filters or biofilters to mitigate odours emitted from treatment processes.
- Optimise the treatment works and technologies to minimise the odour from the plant release
- Creating natural buffer zones around the facility can help mitigate the impact of odours on nearby residents and ecosystems.

7.5.5 Social Stigma and Discrimination:

Communities located near poorly managed sewerage systems may experience social stigma and discrimination due to the perception of living in unhygienic or polluted environments. This can lead to social isolation, marginalization, and disparities in access to basic services and amenities.

- Engage with local communities to understand their concerns, perceptions, and cultural beliefs regarding sewer systems.
- Conduct educational campaigns to dispel myths, misconceptions, and negative stereotypes associated with sewer systems.
- Address concerns related to health risks and safety associated with sewer systems through effective risk communication and public health interventions
- Celebrate achievements and successes in sewer projects to instil a sense of community pride and ownership.
- The WSP to conduct CSR activities for the stigmatized communities
- Implement behavioural change interventions to promote positive sanitation and hygiene practices within communities.
- Build the capacity of local communities to actively participate in sewer system management, maintenance, and decision-making processes.
- Ensure that sewer project is inclusive and accessible to all members of the community, including marginalized or vulnerable groups.

7.5.6 Vandalism

The intentional and malicious acts aimed at damaging, destroying, or tampering with components of the sewer system can end up leading to sanitation catastrophes. This can have significant repercussions, including service disruptions, environmental contamination, public health risks, accidents and financial losses. Some of the mitigation measures include:

- Foster positive relationships with the community through education, outreach, and collaboration to promote a sense of ownership and responsibility for sewer infrastructure.
- Implement surveillance cameras, lighting, fencing, and security patrols to deter vandals and enhance the security of critical sewer facilities.
- Raise awareness about the impacts of vandalism on public health, the environment, and community well-being, and encourage reporting of suspicious activities to authorities.
- Enforce strict penalties and legal consequences for acts of vandalism, including fines, restitution, and criminal prosecution, to deter future offenses and hold perpetrators accountable

7.5.1. Occupational Safety and Health Concerns

During the operation and maintenance phases of the Last Mile Connectivity (LMC) sewerage project in Meru Municipality, several occupational health and safety issues may arise. This will include but not limited to:

1. **Exposure to Hazardous Materials:** Workers involved in the operation and maintenance of sewerage systems may be exposed to hazardous materials include sewage, chemicals, and cleaning agents. Exposure to these substances may pose health risks, including skin irritation, respiratory problems, and water related infections.

2. **Confined Space Hazards:** Maintenance activities often require workers to enter confined spaces such as manholes, sewers, and treatment tanks. These confined spaces present hazards such as poor ventilation, limited visibility, and the risk of engulfment or entrapment, increasing the likelihood of accidents and injuries.

3. **Slips, Trips, and Falls:** The presence of water, slippery surfaces, and uneven terrain in sewerage infrastructure areas can increase the risk of slips, trips, and falls for workers. This risk is further heightened during adverse weather conditions such as rain or flooding.

4. **Mechanical and Electrical Hazards:** Workers operating machinery and equipment during maintenance activities may be exposed to mechanical hazards such as moving parts, entanglement, and crush injuries. Additionally, electrical

hazards may arise from the use of electrical tools and equipment in wet environments.

5. **Biological Hazards:** Sewage systems contains bacteria, viruses, and other pathogens that can pose a risk of infection to workers if proper hygiene and sanitation measures are not followed. Exposure to sewage can lead to gastrointestinal illnesses, skin infections, and other health problems.

6. **Noise and Vibration Exposure:** Workers may be exposed to high levels of noise and vibration from machinery and equipment used in sewerage operations and maintenance. Prolonged exposure to these environmental factors can lead to hearing loss, musculoskeletal disorders, and other health issues.

7. **Manual Handling and Ergonomic Risks:** Manual handling tasks such as lifting heavy equipment, carrying tools, and working in awkward positions can increase the risk of musculoskeletal injuries such as strains, sprains, and back pain. Proper training and ergonomic practices are essential to mitigate these risks

Mitigation Measures

- Provide comprehensive training to workers on occupational safety and health protocols, including hazard identification, safe work practices, and emergency procedures.
- Implement a permit-to-work system for confined space entry and other high-risk activities, ensuring that proper safety precautions are in place before work begins.
- Conduct regular inspections and maintenance of equipment and infrastructure to identify and address potential hazards promptly.
- Provide appropriate personal protective equipment (PPE) such as gloves, goggles, respirators, and protective clothing to workers, and ensure its proper use and maintenance.
- Establish a system for reporting and investigating accidents, near misses, and hazardous conditions, and take corrective actions to prevent recurrence.
- Implement engineering controls such as barriers, and guards to minimize exposure to hazards.
- Develop and communicate standard operating procedures (SOPs) for all tasks, emphasizing safety precautions and risk mitigation measures.
- Monitor environmental factors including noise levels, air quality, and temperature to ensure compliance with occupational safety and health standards.
- Provide access to medical facilities and emergency response services in case of injuries or health emergencies.
- Promote a safety culture within the WSP through regular safety meetings, training sessions, and awareness campaigns, encouraging active participation and collaboration among workers and management

7.6. Impacts During Decommissioning Phase

7.6.1 Air Pollution

Due to vehicle emissions and machinery activity during decommissioning, air quality degradation is a concern. Dust generation from sites access and material piling could contribute to local air pollution. Mitigation:

- Provide appropriate Personal Protective Equipment (PPE) for decommissioning workers.
- Apply water on uneven or bare areas at the project site and nearby access roads to suppress dust.

7.6.2 Solid Waste Generation

Decommissioning will produce diverse solid waste like debris, concrete, human waste, and food waste. Inadequate handling and disposal could lead to environmental pollution. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. In addition, even the generally non-toxic chemicals such as chloride, sodium, sulphate and ammonia, which may be released as a result of leaching of demolition waste, are known to lead to degradation of water quality.

Mitigation:

- Execute careful demolition to maximize material reusability.
- Sell or donate reusable/recyclable materials to minimize waste.
- Adhere to an approved Decommissioning plan by NEMA for proper site rehabilitation and waste management.

7.6.3 Water Pollution

Decommissioning has the potential to contaminate the nearby water bodies or groundwater sources as a result of activities undertaken to dismantle, remove, or deactivate the sewer treatment infrastructure. Decommissioning will involve various tasks, such as removing equipment, excavating pipes, and handling materials, which could introduce pollutants into the environment if not properly managed. The pollution can adversely affect the quality and safety of water resources, posing risks to aquatic ecosystems, human health, and the broader environment.

Runoff and Surface Water Contamination: Rainwater or surface water runoff from the decommissioning site can pick up pollutants from exposed surfaces, equipment, or stockpiled materials, carrying them into Rupingazi River System streams, or other water bodies. Spills and Accidents: Accidental spills of fuels, lubricants, or chemicals during the decommissioning process can directly release pollutants into the environment, posing an immediate threat to water quality.

- **Waste Management:** Implement a comprehensive waste management plan that outlines proper handling, storage, and disposal of materials and waste generated during decommissioning. Separate hazardous and non-hazardous waste and ensure their appropriate disposal according to local regulations.
- **Contaminant Control:** Minimize the use of harmful chemicals or substances during decommissioning. Properly manage and store any potential contaminants to prevent leakage or runoff into surrounding water bodies.
- **Spill Prevention and Response:** Develop spill prevention and response protocols to handle any accidental releases of pollutants. Have spill kits and containment measures readily available.
- **Revegetation and Site Restoration:** After decommissioning, implement revegetation and site restoration to stabilize soil, reduce erosion, and prevent runoff of pollutants into water bodies

7.6.4 Noise and Vibration

The demolition works will lead to significant deterioration of the environment within the project site and the surrounding areas through noise and vibrations.

Mitigation

- Scheduling: Demolition activities that generate significant noise can be scheduled during daytime hours when the impact on nearby residents is expected to be lower. Avoiding demolition activities during early morning, late evening, and night hours can help reduce disturbance.
- Equipment Selection: Choosing construction equipment and machinery that are specifically designed to minimize noise emissions can significantly reduce noise levels. Opting for quieter alternatives and using equipment with noise-reducing technologies can be effective in mitigating noise impacts.
- Equipment Maintenance: Regular maintenance and inspection of construction equipment can prevent excessive noise caused by mechanical issues, ensuring that the machinery operates at optimal noise levels.
- Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible

7.6.5 Occupational Health and Safety Concerns

Decommissioning phase poses risks such as accidents due to material movement. Safety concerns arise from leftover cables, uncovered holes, and structures, posing physical injury risks to passers-by if not managed effectively.

Mitigation:

- Supply proper Personal Protective Equipment (PPE).
- Train workers in general safety, first aid, and fire procedures.
- Establish designated pathways for machinery and personnel movement.
- Ensure mechanisms for reporting incidents, accidents, and dangerous occurrences.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMMP)

8.1. Introduction

It is acknowledged that the proposed project activities will have various effects on the physical environment, public health and safety, as well as the socio-economic conditions of the municipality and other stakeholders. The primary objective is to minimize adverse impacts and enhance positive outcomes throughout the entire project duration, while remaining committed to ongoing enhancement. To effectively address and mitigate these effects, an Environmental and Social Management Plan (ESM&MP) has been developed. It serves as an extensive guide for effectively managing the environmental, social, health, and safety aspects of the project

Throughout the construction phase, the primary responsibility for adhering to the ESM&MP rests with the contractor and TWWDA. Upon transitioning to the operational stage, this responsibility transfers to MeWaSS ESM&MP implementation team. Effective monitoring and evaluation processes should be carried out to identify any instances of non-compliance by the contractor. Additionally, adequate resources need to be allocated for the operational phase to implement the ESMMP).

The table 8-1 Presents the entirety of the ESSMP with the impacts, mitigation measures, responsibility for implementation of the component and the cost estimates needed to implement it.

Table 8-1: ESMMP for the proposed project activities

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
CONSTRUCTION PHASE					
Environmental Issues					
Biodiversity loss and habitat destruction	• Tress of cultural and environmental importance shall be avoided by all means possible • Where possible the contractor to exercise selective removal of mature, indigenous trees and vegetation • Any area around the project site that will not be used for construction purposes will be restored and landscaped to the original state with addition of aesthetic beauty by planting indigenous trees .	Contractor TWWDA	Tree loss	Continuous	200,000
Disturbance of utilities	• Use non-destructive excavation techniques • Coordinate with utility providers to relocate or protect underground infrastructure as needed to accommodate sewer line construction. • Prior to construction, the proponents and contractor should establish temporary alternative water supply sources for the residents. • Divide the construction process into phases to minimize the area of disturbance at any given time.	TWWDA Contractor	Bursts and terminations caused	Continuous	1,000,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• Implement controlled excavation techniques to minimize the disturbance to the surrounding pipes. • Involve the local community in the planning and execution of construction activities.				
Public Health and Safety Concerns	• Site Protection: Hoarding will restrict access to the sensitive construction sites, preventing unauthorized entry and accidents. • The open trenches excavated always be covered at all times whenever possible if not a reflective barricade shall be done. • Clear signage to warn the public of construction hazards, to be erected at points of work hence promoting safety awareness. • Workers to be provided with appropriate protective gear such as helmets, goggles, gloves, and safety shoes. • Workers will receive first aid training, and a first-aid kit will be available on-site for prompt treatment of injuries. • A register will track injuries, near misses, and safety incidents, facilitating analysis for improvement. • Delivery drivers will be instructed to drive safely, especially near settlements, to prevent accidents.	TWWDA Contractor	Incidences and near misses record	Continuous	10,000,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• A plan to outline procedures for accident response, ensuring a coordinated and timely response. • Contact information for emergency services will be readily available on-site for quick access				
Traffic congestion	• Planning construction activities to minimize disruption during peak travel times or major events can help reduce traffic congestion. • Employing traffic marshals • Implementing effective traffic management plans, including temporary traffic control measures, signage, and flagging operations, can help maintain traffic flow and minimize delays. • Providing information to motorists about alternative routes and detours can help distribute traffic away from congested areas. • Engaging with the community and stakeholders through public outreach and communication campaigns can raise awareness about construction-related traffic impacts and encourage cooperation and understanding during the project. • Collaborating with local transportation agencies and authorities to coordinate construction schedules.	TWWDA Contractor	Traffic flow	Continuous	1,000,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
Solid waste Generation	• Implement measures to minimize waste generation, such as optimizing pipe lengths to reduce offcuts • Segregate construction waste at the source and prioritize recycling of materials such as concrete, metal, and asphalt. • Ensure proper disposal of non-recyclable waste by transporting it to approved landfill facilities. • Identify and segregate hazardous waste streams, such as contaminated soil or construction chemicals, and handle them according to applicable hazardous waste regulations. • Monitoring and Compliance: Monitor solid waste generation and disposal activities throughout the construction process to ensure compliance with waste management plans and regulatory requirements. • Implement the Waste Management Plan: • The excavation will be done according to the planned work and designs.	Contractor	Litter on site	Continuous	300,000
Air Pollution	• Watering all active construction areas when necessary to reduce dust emission. • Cover all trucks hauling soil, sand and other loose materials or require all trucks	Contractor	Air Quality	Continuous	200,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	to maintain at least two feet of freeboard. • Project to be undertaken in phases to cushion the cumulative effects of dust, which would be great in case the project is done at once. • Carry out suitable maintenance on all machinery to be used to avoid the emission of noxious gases. • Drivers and machine operator to avoid unnecessary running of motor vehicle engines and machinery when not in use. • Use of wet methods through water sprays and mists as dust suppression measures • Provision of suitable PPE/C such as nose masks to the workers and staff on site.				
Water Pollution	• Construct siltation basins or sedimentation ponds at strategic locations to capture sediment-laden runoff from construction activities. • Establish vegetative buffer strips along watercourses and drainage channels to help filter and trap sediment and pollutants before they reach surface water. • Implement stormwater management practices such as detention ponds,	Contractor	Water Quality test results	Continuous	200,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	vegetated swales, and permeable pavements to capture and treat runoff from construction sites before it is discharged into water bodies. • Develop spill prevention and response plans to minimize the risk of sewage spills or leaks during construction activities. • Conduct regular water quality monitoring to assess the impact of construction activities on nearby water bodies. • Collection of Oils and Greases: Oils and greases resulting from repair and maintenance activities will be collected in designated containers to prevent their release into the environment. • Waste from sanitation facilities will be collected and transported by a licensed waste transporter to ensure proper disposal and prevent contamination of water sources				
Noise and Vibrations	• Construction activities that generate significant noise to be scheduled during daytime hours. • Utilize construction machinery and equipment that are designed to produce less noise.	Contractor	Noise Levels	Continuous	10,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• Install temporary noise barriers or enclosures around construction sites to contain and reduce noise levels. • Implement noise-reducing construction techniques and employing low-noise construction methods wherever possible. • Maintain open communication with nearby residents and stakeholders throughout the construction process. Provide advance notice of upcoming noisy construction activities. • Adhere to the Environmental Management and Coordination (Noise and Excessive Vibration Pollution) (Control) Regulations, 2009 regarding noise limits at the workplace.				
Disturbance of Enterprises	• Maintain regular communication with affected businesses to provide updates on construction schedules, anticipated disruptions, and mitigation measures. • Seek alternative access routes or pedestrian pathways to businesses affected by road closures or construction activities. The contractor to provide clear	TWWDA Contractor	Complains record	Continuous	100,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• Schedule construction activities during off-peak hours or non-business hours whenever possible.				
Social Issues					
Sexual Exploitation and Abuse	• Establish clear policies prohibiting sexual harassment and exploitation in the workplace and ensure that workers are aware of their rights and avenues for reporting. • Provide comprehensive training to all workers, supervisors, and management on preventing sexual exploitation and creating a safe and respectful work environment. • Implement confidential and accessible complaint mechanisms for reporting incidents of sexual exploitation, ensuring that victims can seek assistance without fear of reprisal. • Provide victims of sexual exploitation with access to medical care, counselling, legal assistance, and other support services to address their immediate needs and facilitate their recovery	Contractor / TWWDA	Mitigation plan for GBV occurring at the community level as a result of project implementation Number of GBV cases happening at the community level that receive survivor centred referral and care	Throughout construction Period	250,000

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
Increased Crime	• Foster positive relationships between construction teams and the local community through regular communication, outreach programs, and community meetings. • Employ security officers on site • Collaborate with local police and public administration to address security concerns and deploy resources effectively. Joint patrols, crime prevention initiatives, and information-sharing mechanisms can enhance safety and security in construction zones. • The contractor to provide employment opportunities for local residents in construction-related roles, thereby reducing reliance on transient labour and fostering a sense of ownership and investment in the project's success. • Educate community members about crime prevention strategies, the importance of reporting suspicious activity, and available support services	TWWDA Contractor Kenya Police Service Public administration	Crime reported on site	Continuous	500,000
Project related conflicts	• Adhere to the provisions in the Grievance readdress mechanism	TWWDA	Reported conflicts in the GRM Log	Continuous	Nil
TOTAL		**13,760,000.00**			
OPERATION PHASE					

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
Water Pollution	• Implement advanced treatment technologies to remove a broader range of pollutants. • Enhance monitoring and enforcement of discharge permits to ensure compliance with water quality standards. • Invest in green infrastructure solutions like constructed wetlands or vegetated buffers to naturally filter and treat wastewater before it enters water bodies. • Adhere to the provisions of EMCA (Water quality Regulations)	MeWaSS	Water quality in the drainage area	Monthly	**120, 000**
Spread of Water borne diseases	• The managing team should ensure that all sewage undergoes proper treatment before discharge into water bodies. • Conduct routine monitoring and testing of wastewater to assess its quality and ensure compliance with water quality standards for timely corrective actions. • Invest in the maintenance, and upgrading of sewerage infrastructure that improve efficiency including sewage treatment plants and sewer lines • Develop and implement emergency response plans to address sewage spills, leaks, or other incidents that may pose a risk to public health	MeWaSS County Public Health	Incidences of water borne diseases Water tests	Monthly	**150,000**

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
Ecological Changes	• Conduct thorough Biodiversity Assessment prior to construction to identify and minimize impacts on sensitive habitats. • Continuously monitor the effluent chemical composition • Develop an efficient Effluent discharge Plan • Adhere to the biodiversity management plan • Implement measures to minimize land disturbance and habitat loss during operation. • Implement habitat restoration or creation projects to offset any unavoidable habitat loss.	MeWaSS	Biodiversity changes	Annual Biodiversity Assessment Annual Environmental Audits	**400,000**
Odour and Aesthetic Issues	• Implement odour control technologies such as activated carbon filters or biofilters to mitigate odours emitted from treatment processes. • Optimise the treatment works and technologies to minimise the odour from the plant release • Creating natural buffer zones around the facility can help mitigate the impact of	MeWaSS	Smell and air quality test	Continuous	**100,000**

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	odours on nearby residents and ecosystems				
Social Stigma and Discrimination	• Engage with local communities to understand their concerns, perceptions, and cultural beliefs regarding sewer systems. • Conduct educational campaigns to dispel myths, misconceptions, and negative stereotypes associated with sewer systems. • Address concerns related to health risks and safety associated with sewer systems through effective risk communication and public health interventions • Celebrate achievements and successes in sewer projects to instil a sense of community pride and ownership. • The WSP to conduct CSR activities for the stigmatized communities • Implement behavioural change interventions to promote positive sanitation and hygiene practices within communities. • Build the capacity of local communities to actively participate in sewer system management, maintenance, and decision-making processes.	MeWaSS County Government of Meru Public Health	Reports	Continuous	**150,000**

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• Ensure that sewer project is inclusive and accessible to all members of the community, including marginalized or vulnerable groups.				
Vandalism	• Foster positive relationships with the community through education, outreach, and collaboration to promote a sense of ownership and responsibility for sewer infrastructure. • Implement surveillance cameras, lighting, fencing, and security patrols to deter vandals and enhance the security of critical sewer facilities. • Raise awareness about the impacts of vandalism on public health, the environment, and community well-being, and encourage reporting of suspicious activities to authorities. • Enforce strict penalties and legal consequences for acts of vandalism, including fines, restitution, and criminal prosecution, to deter future offenses and hold perpetrators accountable	MeWaSS Kenya Police Service	OB reports Crime incidences on water and sanitation infrastructure	Continuous	**100,000**
Occupational Health and Safety Concerns	• Provide comprehensive training to workers on occupational safety and health protocols, including hazard identification, safe work practices, and emergency procedures.	MeWaSS	Number of accidents and near misses	Continuous	**2,000,000**

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	• Implement a permit-to-work system for confined space entry and other high-risk activities, ensuring that proper safety precautions are in place before work begins. • Conduct regular inspections and maintenance of equipment and infrastructure to identify and address potential hazards promptly. • Provide appropriate personal protective equipment (PPE) such as gloves, goggles, respirators, and protective clothing to workers, and ensure its proper use and maintenance. • Establish a system for reporting and investigating accidents, near misses, and hazardous conditions, and take corrective actions to prevent recurrence. • Implement engineering controls such as barriers, and guards to minimize exposure to hazards. • Develop and communicate standard operating procedures (SOPs) for all tasks, emphasizing safety precautions and risk mitigation measures. • Monitor environmental factors including noise levels, air quality, and				

IMPACT	MITIGATION	RESPONSIBILITY	INDICATOR	FREQUENCY	COST (Ksh)
	temperature to ensure compliance with occupational safety and health standards. • Provide access to medical facilities and emergency response services in case of injuries or health emergencies. • Promote a safety culture within the WSP through regular safety meetings, training sessions, and awareness campaigns, encouraging active participation and collaboration among workers and management				
TOTALS		**2,900,000.00**			

8.2. Management Responsibility of the ESMMP

This section outlines the key entities involved in the implementation of the Environmental and Social Management and Monitoring Plan for the project, along with their respective roles and responsibilities. It provides clarity on who is accountable for various aspects of environmental and social management, stakeholder engagement, health and safety, and monitoring and evaluation throughout the project lifecycle.

Table 8-2: Roles and Responsibilities of various entities in ESMMP implementation

Entity	Roles and Responsibilities in ESMMP Implementation
Tana Water Works Development Agency (TWWDA)	• To ensure that all project operations are conducted in accordance with their internal environmental policies and in accordance with the ESMMP • Ensure that all authorizations/Approvals/Licenses required for project implementation are obtained; • Request the contractor operates on the basis of valid Authorizations/approvals/licenses for the activities to be implemented; • Ensure that the EMP is an integral part of the contract document with the Contractor and that the contractor will be responsible for its implementation; • Establish institutional linkages with relevant parties in the project implementation as needed, or designate a representative for that purpose; • Ensure that the various project activities comply with the mitigation measures proposed in the Environmental Management and Monitoring Program (ESMMP); • Make regular inspections to all the different activities with regard to social aspects, health, safety and environment and check for any non-conformity with the ESMMP attributable to the Contractor and identify the steps taken for its correction
National Environmental Management Authority (NEMA)	Regulatory function • Co-ordinate the various environmental management activities being undertaken by the lead agencies and promote the integration of environmental considerations into development policies, plans, programmes and projects. • Identify projects and programmes or types of projects and programmes, plans and policies for which environmental audit or environmental monitoring must be conducted under this Act; • Monitor and assess activities, including activities being carried out by relevant lead agencies, in order to ensure that the environment is not degraded by such activities
MeWaSS	• Operate and maintain the water supply system in a manner that will reduce non-revenue water

Entity	Roles and Responsibilities in ESMMP Implementation
	• Carry out effluent quality analysis in collaboration with other government lead agencies • Ensure treated wastewater and sludge for re-use/disposal meets accepted health standards • Conduct regular monitoring and inspection to ensure facilities are not interfered with • Ensure that effluent discharged from industries into the sewage system is treated and meets effluent discharge quality standards
Contractor	• Prepare own ESMP implementation plan as well as a health and safety action plan within 30 days of signing of the contract. • Operate on the basis of valid Licenses/Approvals/Authorizations for the activities to be implemented; • Prevent or minimize the occurrence of accidents which might cause damage to the environment and be able to respond positively to an accident if it occurs; • Ensure compliance to working procedures and environmental requirements and health and safety established in the contract with the Proponent; • Minimize environmental damage, waste control, avoid pollution, prevent loss or damage on natural resources and minimize the effects on the users and occupants of surrounding lands and the public; • Provide Personal Protective Equipment (PPE) to workers which are appropriate to the tasks to be performed and ensure that it is used; • Manage the complaints process on the elements that fall within its jurisdiction, or refer complaints to the Proponent, so that they can receive treatment/appropriate response;
Supervising Consultant/ Resident Engineer	• To ensure that the ESMMP is up to-date and is being used by the contractor. • Conduct periodic audits of the ESMMP to ensure that its performance is as expected
Meru County Government	• The relevant departmental officers in the above county government will be called upon where necessary during Project implementation to provide the necessary permits and advisory services to the project implementers
Directorate of Occupational Safety and Health Services (DOSHS)	• To register the project site as a work station and subsequent enforcement of relevant provisions in occupational safety and health in line with Occupational Safety and Health Act, 2007.

Entity	Roles and Responsibilities in ESMMP Implementation
Water Resource Authority (WRA)	• Monitor and enforce conditions attached to water permits and water use; • Regulate and protect water resources quality from adverse impacts; • Regulate and protect water resources from adverse impacts; • Regulate water infrastructure, use and effluent discharge; • Work with the beneficiary communities to manage and protect water catchments; • Establish water resources monitoring networks

8.3. Monitoring and Auditing of ESMMP

Environmental monitoring and audits are essential in the project's life span as they are conducted to establish if project implementation has complied with set environmental management standards in accordance with applicable legislation and regulations. In this Project, environmental monitoring and audit will be conducted to ensure that identified potential negative impacts are mitigated during the project's implementation, operation and decommissioning periods. Environmental concerns, that will be monitored and audited during the project's construction and maintenance period include: water quality, air quality, and occupational health and safety issues.

8.3.1 Monitoring of Occupational Health and Safety Issues

Project activities during the construction and operation phase involve a lot of risks and exposure to hazards. It is therefore important to regularly check and monitor the activities to find out the extent to which the impacts are mitigated and emerging problems are addressed. Table 4.3 presents a monitoring plan of the key issues key verifiable indicators which will be used to monitor the impacts are presented below.

Table 8-3: Monitoring of Occupational Health and Safety Issues

Monitoring Parameters	Responsibility	Monitoring Location(s)	Time/Frequency	Indicators
Condition of machinery and equipment	Contractor TWWDA	At work stations	Weekly	Service, maintenance, repair or replacement records of faulty machines
Accidents, incidents, injuries etc.	Contractor, TWWDA	At work stations	Daily	Mitigation/prevention measures in place, PPEs, Records of incidents or accidents, medical records, Training, First Aid kits; Fire extinguishers

Monitoring Parameters	Responsibility	Monitoring Location(s)	Time/Frequency	Indicators
Dust and exhaust emission	Contractor, TWWDA	At work stations	Daily	Health safety measures in place
Noise emissions	Contractor	At work stations	Daily	Noise monitoring records
Sanitation and welfare facilities	Contractor, TWWDA	Workers camps, construction sites and site offices	Weekly	Presence of sanitation & welfare facilities
Oil Spills and Leakages	Contractor	Workers camps and construction sites	Daily	Records of daily inspections
Solid Wastes	Contractor, TWWDA	Workers camps, construction sites Site offices	Daily/weekly	Inspection and waste disposal records

8.3.2 Waste Water Monitoring Plan

Table 8-4: Waste Water Monitoring Plan

Monitoring Parameters	Responsibility	Monitoring Location(s)	Time/Frequency	Indicators
BOD, Temperature, Total Suspended Solids (TSS), COD, ammonia nitrogen (NH3-N), PH and faecal coliform counts	MEWASS	Treated water at discharge point from WWTP Sampling points at the Stream	Daily, weekly as required	Quality of water downstream
Industrial effluent (Temperature, COD, BOD5, oils & grease, suspended solids, N, P, pH, sulphates, chlorates, Fe, Cu, Cr, Zn, Ni).	MEWASS	Effluent discharge points	Quarterly	Conformity to effluent discharge standards

8.3.3 Sludge Monitoring

Sampling and analysis of sludge content is essential before sludge is put into agricultural use or disposed of. The operator should therefore draft a sampling and analysis plan and identify acceptable and certified laboratories to conduct the analysis. Sludge should be tested for toxicity

in order to demonstrate that the sludge or sludge products are not hazardous and that it is suitable for land-based applications. Table 4.5 shows the sludge monitoring parameters.

Table 8-5: Sludge Monitoring Parameters

Monitoring Parameters	Responsibility	Monitoring Location(s)	Time/Frequency	Indicators
PH, NH4, P2O5, K2O, CaO, MgO, Fe, Mn, Mo, Cd, Cr, Cu, Hg, Ni, NH4, N, B, Pb, Zn, PCB	MEWASS	At the WWTP	To be determined by the operator	Sludge quality depending on its intended use

8.3.4 Air Quality Monitoring

Odour emissions from waste water treatment plants are generally of much concern to local communities residing in the vicinity of the project site. Odour development is a process that begins at the point of wastewater discharge from homes and industries. It continues with collection and movement of wastewater in gravity sewers and ends with the actual wastewater treatment, solids handling and disposal at the plant or disposal site. Careful sampling and analysis of gases to identify and characterize the odours is of necessity towards the control of offensive odours. Odours can be quantified by direct sensory measurement of their concentration and intensity, using the human olfactory sense as the odour detector. Alternatively, chemical analysis of odour constituents could be performed. Portable gas monitoring devices are also available and can be used in monitoring of odours. The main monitoring parameters are hydrogen sulphide and ammonia.

Table 8-6: Air Quality Monitoring Parameters

Monitoring Parameters	Responsibility	Monitoring Location(s)	Time/Frequency	Indicators
Hydrogen Sulphide, Methane, Sulphur dioxide,	MEWASS	At the WWTP site	Yearly, or as need arises	Ambient air quality around the WWTP

8.3.5 Decommissioning Plan

The Project has been designed to operate effectively for over 20years. Before commencement of decommissioning activities, the proponent shall develop a Decommissioning Plan. The plan will guide on the various activities which will include the following:

- Details of infrastructure, buildings and structures to be retained; alternative uses and further development proposals for retained infrastructure, and structures; infrastructure and structures to be dismantled, removed, sold for recycling and / or disposed-off.
- Environmental restoration plan. The dismantling of site facilities and transportation of material may expose the ground, leave open pits and disturb vegetation. Such sites can be restored by backfilling with soil and replanting of grass or trees on disturbed areas.

- Waste Management Plan – A formal site waste management plan should be developed to ensure that both solid and liquid waste is managed in accordance to the existing applicable laws on waste handling and disposal.
- Health & Safety plan that shall be implemented to safeguard the safety, health and welfare of workers and the public. Establish and operate an emergency evacuation procedure for casualties.
- Mechanisms for addressing project related social issues
- Take note of any existing regional and national development plans that may be of relevance to the area.

In the event that the infrastructure will be required to be overhauled, then the following steps should be considered in order to undertake the procedure in a structured manner with minimum impact to both human and natural environment as illustrated in Table 9-5 below.

Table 8-7: Steps for Overhauling Infrastructure

Stage	**Action**	**Actor**
Step 1	• Initiation • Development of an Objective Worksheet and checklist incorporating references, legal and policies • Undertake decommissioning audit	Proponent
Step 2	• Prepare Road Map for Decommissioning Design • Conduct design review to validate elements of the design and ensure design features are incorporated in the decommissioning design • Public consultations	Proponent
Step 3	• Prepare and Award Contract • Prepare a contract that incorporates validated Project information and award to a contractor as per the Procurement rules.	Proponent
Step 4	• Execute Decommission Works • Implement design elements and criteria on the Project in accordance with specifications and drawings. • Inspect during decommissioning and at Project completion to ensure that all design elements are implemented according to design specifications.	Contractor
Step 5	Commissioning Environmental Management Plan	Contractor

9. CONCLUSION AND RECOMENDATIONS

The Meru sewerage Last Mile Connectivity project holds significant promise for enhancing sanitation infrastructure and improving the quality of life for residents in the Meru municipality. The extension of sewer lines to previously underserved areas will address longstanding challenges related to inadequate sanitation and wastewater management. However, the successful implementation of the project requires careful consideration of environmental and social factors, as well as proactive measures to mitigate potential risks and maximize benefits.

The ESIA team has identified a range of anticipated environmental and social impacts and designed adequate enhancement and mitigation measures to ensure maximum benefits from the proposed project are achieved and adverse impacts are well mitigated. A comprehensive Environmental and Social Management and Monitoring Plan has also been developed encompassing a range of measures aimed at safeguarding the environment, promoting social inclusivity, preserving public health, and fostering economic sustainability.

The ESIA team therefore recommends approval and licensing of the proposed Meru Sewerage LMC Project as a step towards improving access to proper sanitation facilities and generally enhancing the overall quality of life to project beneficiaries. The following key recommendations should be taken into consideration during project implementation:

1. TWWDA should continue to engage with affected communities, local authorities, and other stakeholders throughout the project lifecycle to ensure their emerging concerns are addressed, and their input is incorporated into decision-making processes.

2. The proponent to ensure strict adherence to the project ESMMP by the contractors and other concerned parties during the entire project cycle

3. Regular monitoring of the project to assess the level of adherence to the project ESMP and its efficacy. The ESMMP should be reviewed on a need basis to capture emerging issues during project implementation.

REFFERENCES

AfDB. 2013. *African Development Bank Group's Integrated Safeguards System 2013*.

GoK. 2012. *Sessional Paper No.....of 2012 On Kenya Vision 2030 Office of the Prime Minister Ministry of State for Planning, National Development and Vision 2030*.

GoK. 2021. *Sessional Paper No 1 on National Water Policy 2021*.

Kenya Environmental Sanitation and Hygiene Policy. 2016.

"Legal Notice 31 & 32 of 2019 on EIA." 2019.

Lengkeek, A. G., R. Kindt, L. J.G. Van Der Maesen, A. J. Simons, and D. C.C. Van Oijen. 2005. "Tree Density and Germplasm Source in Agroforestry Ecosystems in Meru, Mount Kenya." *Genetic Resources and Crop Evolution* 52(6): 709–21. doi:10.1007/s10722-003-6021-9.

"Meru CIDP 2023 - 2027."

"Mount Kenya National Park Natural Forest - 2020 COA - En." *Mt Kenya Ecosystem*. 2010.

EMCA. 2012. 'Laws of Kenya Environmental Management and Co-Ordination Act'. *Emca* 3(8): 81. http://www.kenyalaw.org/.

Government of Kenya (2000): Kenya gazette supplement Acts, Environmental Management and Coordination Act Number 8 of 1999 and 2015 Amendments (Cap 387). Government printer, Nairobi, Kenya.

Government of Kenya (2003): Kenya gazette supplement number 56. Environmental Impact Assessment and Audit Regulations, Government Printers, Nairobi, Kenya.

Government of Kenya (2007): The Occupational Safety and Health Act, Government Printers, Nairobi, Kenya.

Government of Kenya (2010). The constitution of Kenya, government printer, Nairobi, Kenya

Government of Kenya (2012): The Land Act, Government Printer, Nairobi, Kenya.

Government of Kenya (2012): The Land Registration Act, Government Printer, Nairobi

Government of Kenya (2012): The National Land Commission Act, Government Printer, Nairobi, Kenya.

Government of Kenya. (2008). Vision 2030, government printer, Nairobi, Kenya.

Government of Kenya. (2012). National Environmental Policy, government printer, Nairobi, Kenya.

Government of Kenya. (2012). Public Health Act (Cap 242), government printer, Nairobi, Kenya.

Government of Kenya. (2012). The County Government act, 2012, government printer, Nairobi, Kenya

Government of Kenya. (2012). The National Land policy, 2012, government printer, Nairobi, Kenya

Government of Kenya. (2014). National Energy Policy, government printer, Nairobi, Kenya

Government of Kenya. (2019). Energy Act, 2019, government printer, Nairobi, Kenya.

International Finance Corporation/World Bank Group (2007): General Environmental, Health, and Safety (EHS) Guidelines.

Kenya gazette supplement Acts Land Planning Act (Cap. 303) government printer, Nairobi

Kenya gazette supplement Acts Physical Planning and Land Use Act, 2019 government printer, Nairobi

Kenya gazette supplement Acts Water Act, 2016 government printer, Nairobi

APPENDICES

Appendix 1 Public Meeting Minutes

Meru ESIA & RAP MINUTES AT DCC BOARDROOM.pdf

Meru ESIA AND RAP MINUTES AT KINORU STADIUM HALL.pdf

Appendix 2 Public Participation List

Meru Sewer LMC
Public participation

Appendix 3: Public participation Questionnaires

Questionnaires for Meru Sewer Project LMC.pdf

Appendix 4: Photo Gallery

Figure 1: DCC Samuel addressing the stakeholders

Figure 2: Eng.Kelvin, TWWDA explaining the project to the stakeholders

Figure 3: Lead Expert Mrs. Warimu addressing the stakeholders

Figure 4: Wilson mutuma expressing his concerns

Figure 5: Mr Roy Murithi responding to stakeholders concerns

A section of the road utility that will be disturbed by the project

Experts on site conducting ESIA and RAP activities

Figure 6: Stakeholders present for the meetting at the DCC's boardroom

Appendix 5: Grievance Redress Log

Ref No.	Date	Name	Phone	Post	Email	Description of Grievance	Date of Grievance	One-time grievance	Happened more than once	Ongoing	Expected Resolution/Redress	Action identified to resolve the grievance	Date taken	Taken by whom	Complainant satisfied	If not, why?

TANA WATER WORKS DEVELOPMENT AGENCY

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STAKEHOLDER ENGAGEMENT MINUTES FOR THE PROPOSED LAST MILE CONNECTIVITY OF THE MERU SEWERAGE PROJECT HELD ON 28TH FEBRUARY 2024 AT THE DEPUTY COUNTY COMMISIONER'S BOARDROOM AT 2.30PM

MEMBERS PRESENT

Attendance list attached

AGENDA

The agenda of the meeting was as follows:

- Preliminary matter
- Introduction and presentation of the last mile project to the stakeholders
- Introduction of the ESIA exercise
- Comments and Concerns of the stakeholders
- Closing remarks

MIN 1/28/02/2024: PRELIMINARY MATTER

The Assistant County Commissioner Meru Municipality Division Madam Joyce Mwangi called the meeting to order promptly at 2.30 pm, setting the tone with a prayer led by one of the stakeholders in attendance. This fostered a sense of unity and respect among all present, creating a conducive environment for the meeting's agenda to proceed smoothly.

The ACC welcomed DCC Samuel Njuguna from Central Imenti who was the chair for the stakeholder engagement. The DCC welcomed everyone to the meeting and extended a heartfelt invitation to the Tana Water Works Development Agency and the Environmental Consultant team to express themselves freely. He explained to the stakeholders the intentions of the meeting regarding the Proposed Last Mile Connectivity of Meru Sewerage Project. Additionally, he encouraged every stakeholder to voice their thoughts and concerns regarding the project, emphasizing an open and inclusive atmosphere for discussions. He then opened the floor for the representative from the Proponent's side (Tana Water Development Agency) Eng. Kevin Njuki to take over the meeting.

MIN 2/28/02/2024: INTRODUCTION AND PRESENTATION OF THE PROJECT

Eng. Kevin Njuki from TWWDA gave his opening remarks and explained to the stakeholders the objectives of Tana Water Works Development Agency in ensuring sustainable sanitation systems within their area of jurisdiction in Meru County. He went on to elaborate that the agency is currently planning to execute the last mile sewerage connectivity within Meru Municipality. He emphasised that the project aims to bridge gaps in sanitation within the 1st phase of the Kenya Towns Sustainable Water Supply and Sanitation Program. He explained to the stakeholders that the project would mainly utilize the road reserve areas within the municipality.

He later explained to the stakeholders that public consultations regarding the project are what led to the convention of the meeting. He asked members of the community to feel free to ask any question and raise any concerns as he welcomed the consultant team leader Mrs Bernadett Wairimu to take over the floor.

MIN 3/28/02/2024: INTRODUCTION OF THE ESIA EXERCISE

The ESIA Lead Expert Mrs. Bernadett Wairimu introduced herself and the entire ESIA team and gave a brief of what the meeting entailed. She asked the stakeholders to feel free and interact with her freely as this was a chance given to them to put forward their views regarding the proposed Last Mile Connectivity of the Meru Sewerage project.

MIN 4/28/02/2024: COMMENTS AND CONCERNS OF THE STAKEHOLDERS

NAME OF THE CONCERNED STAKEHOLDER	QUESTION ASKED	RESPONSE FROM THE TECHNICAL TEAM
ACC Japala Kiamwitari division	Enquired about compensation of the affected persons	• Unlike the ongoing sewer treatment plant that involved resettlement of people to pave way for construction, the proposed LMC project would utilise road reserves hence there will be minimal disturbance of people within the municipality. • However, compensation for any person that will be directly affected by the projects shall be done diligently following the Resettlement Action plan that shall be formulated by the consultant.
Madam Margaret	She enquired whether the local labour force would be prioritized	• In a bid to grow the economy of the project area, the contractor shall be keen on hiring locals, especially for unskilled labour.
Brian mwenda	How will the community get sewer services?	• The stakeholders were advised to liaise with area water & sanitation services provider (MEWASS) for connections.
Wilson mutuma	What is the sustainability of the proposed project	• The sewer lines will be constructed durably with plastic DWC pipes which are long-lasting • Once the construction was done the project would be handed over to MEWASS who will

		be tasked with the operation and maintenance of the project infrastructure
Doris mulekyo	Remedy for sewer leakages	• There will be a quick response from the MEWASS operational and maintenance team.

MIN 5/28/02/2024: CLOSING REMARKS

The team leader of the consultants addressed the stakeholders, assuring them that their grievances and wishes would be carefully considered and incorporated into the project's recommendations for possible adoption and integration across the project cycle. She emphasized the importance of sustainability and acknowledged the stakeholders' valuable input in shaping the project's outcomes.

The DCC then took the step to formally conclude the meeting by making a few announcements regarding community development and thanked everyone for their active participation and fruitful contributions during the session.

There being no other business the meeting was adjourned with a closing prayer from Mr. Mustafa Gitonga at 3:30 Pm.

MIN 5/28/02/2024: CLOSING REMARKS

The team leader of the consultants addressed the stakeholders, assuring them that their grievances and wishes would be carefully considered and incorporated into the project's recommendations for possible adoption and integration across the project cycle. She emphasized the importance of sustainability and acknowledged the stakeholders' valuable input in shaping the project's outcomes.

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CONFIRMED BY:

LEAD EXPERT	**THE PUBLIC ADMINISTRATION**
Eng. Bernadett Wairimu NEMA Reg No. 7394 11th, March 2024 Sign.....	**ACC MERU MUNICIPALITY:** Madam Joyce Mwangi Date 12th March 2024 Sign ..... ASSISTANT COUNTY COMMISSIONER MUNICIPALITY DIVISION P. O. Box 703 - 60200, MERU Date: 12/3/2024 Stamp:.....
TWWDA REPRESENTATIVE	
Eng. Kevin Njuki	

TANA WATER WORKS DEVELOPMENT AGENCY

ENVIRONMNETAL AND SOCIAL IMPACT ASSESMENT AND RESETTLEMENT ACTION PLAN PUBLIC PARTICIPATION AND SENSITIZATION MEETING MINUTES FOR THE PROPOSED LASTMILE CONNECTIVITY OF MERU SEWERAGE PROJECT HELD ON THE 7TH, MARCH 2024 AT KINORU STADIUM HALL AT 10:00HRS

MEMBERS PRESENT

Attendance List Attached

AGENDA

The agenda of the meeting was as follows:

- Preliminary matter
- Presentation of the proposed project to the community
- Sensitization of community members
- Comments and Concerns of the Community
- Recommendation
- Closing remarks

MIN 1/07/03/2024: PRELIMINARIES

The Assistant County Commissioner Madam Joyce called the meeting to order at 10:15Hrs and requested Sr Isabella to start of the meeting with a word of prayer

The ACC then initiated the meeting by extending a warm welcome to all attendees expressing her gratitude for their presence. She then requested everyone in the meeting to introduce hi/herself with the institution or village representing.

The ACC later invited the client (TWWDA & MeWaSS) and the consultant (Greenville) teams to share their valuable insights openly. Providing a concise overview of the day's agenda, she focused on the critical matter at hand – the need to address issues with the proposed last mile connectivity of Meru Sewerage project.

MIN 2/05/08/2023: PRESENTATION OF THE PROPOSED PROJECT ACTIVITY

Engineer Kevin Njuki the projects Engineer, then introduced Tana Water Works Development Agency (TWWDA) as one of the nine (9) water Agencies under the Ministry of Water, Sanitation and Irrigation which is supporting the government in developing, maintaining, and managing national public water works to attain sustainable access to quality water and improved sewerage services within its area of jurisdiction. He elucidated that the Agency runs operations in five (5) counties namely: Embu, Kirinyaga, Meru, Nyeri and Tharaka Nithi.

He then delved that as part of the agency’s strategic plan, TWWDA is committed to increasing the water and sewerage coverage in its area of jurisdiction from 57.8% and 8.1% in 2023 to

90% and 30% by 2027 respectively through development of sustainable Water and Sanitation Infrastructure in its area of jurisdiction including Meru. He further went on and explained that the phase 1 laying of main trunk sewers for the Meru Sewerage project was coming to an end and the agency is aiming at implementing the second phase of the project which is the last mile connectivity of the project. The last mile connectivity of the Meru sewerage project is aimed at connecting the sewer line to the final user and residents in Meru mainly within the municipality. The engineer presented the proposed layout to the participants. With the help of Surveyors and technicians from the Meru Water and Sewerage Services the engineer explained in details the villages and estates where the approximately 20Km last mile connectivity of sewerage project had been proposed. He concluded by inviting Irene Mutahi, the Environmentalist from TWWDA to continue with the rest of the presentation.

Ms Mutahi explained to the participants that the proposed last mile connectivity of the Meru Sewerage project is to be undertaken under the National Urban Water Supply and Sanitation Program (NUWaSSaP) which aims at bridging the gaps in access to sewerage and water services in urban areas of Kenya. She further explained that the project shall be implemented with funding being prospected from the African Development Bank. In that regard she explained that as per the Kenyan environmental regulations and the AfDB safeguards systems, there was need to follow the prerequisite procedures before the project is financed including the ESIA and RAP activities for the proposed project activity. She therefore invited Mr Mutuma Murithi from the consultant team to further delve into the issue at hand.

MIN 3/07/03/2024: SENSITIZATION OF THE COMMUNITY MEMBERS

Mr. Mutuma the Expert from the ESIA team, outlined the purpose of the meeting in regards to the ESIA and RAP for the proposed last mile connectivity of the Meru Sewerage project. He went on and explained that the sewerage project was licensed by NEMA at the inception of the project during phase one. However, there was need to adjust the Environmental and Social Impact Management Plan (ESMP) to suite the current baseline conditions. In regards to updating the ESMP, Mr Mutuma explained to the participants that there was need to incorporate the views of the community and institutional members to ensure that the project runs in harmony with the communal activities. He then explained to the residents the minimal negative impacts that could be experienced during the construction phase of Sewerage projects and explained to them the mitigation measures that had been put in place to control the impacts.

He further went on and sensitised the community members on the forth coming resettlement Action Plan activity that was going to take place later for purposes of compensation of livelihoods for the Project Affected Persons (PAP's). He clearly elucidated the aim of RAP and the key information needed from the PAPs to ensure that all information was accurately captured. He also captured how sensitive the exercise was and urged the community members to work with the RAP team that would come following up the surveyed lines.

After the short brief, Mr Mutuma welcomed the community to air out their issues and concerns in regards to the proposed project activities. He encouraged the community members to engage openly, stressing that their input was essential in shaping the proposed LMC of Meru Sewerage project.

MIN 4/07/03/2024: COMMENTS AND CONCERNS FROM THE COMMUNITY

Some of the concerns highlighted by the members of the community have been put in the table below:

NAME	CONCERN	RESPONSE
Joshua Mureithi	• He wanted to understand the scope of the project-whether it was going to cover parts of Rangaini, Milimani and Forest areas in the Municipality • When the proposed works would commence	• Mr. Frank and Ms Carolyne from MeWaSS who did the survey work responded that the areas were captured. They further explained the layout using the local dialect and the local names of areas to allow the community members understand the proposed layout better. • Eng Kevin responded that they were not certain of how soon the proposed works would begin but explained that it would begin after the proponent had complied with all the financier and the national requirements.
Mr Macaria (West gate)	• The terms of compensation of the lost livelihoods • Wanted to know whether the project would incorporate the existing sewer projects which have been serving the town	• Mr Mutuma responded that the compensation would be based on how the proposed project had directly affected the livelihood of the person in regards to the wayleave. He explained that whenever a way leave would lead to demolition of property or destruction of crops and trees, then it would be compensated appropriately as per the outcome values of the RAP. He further assured the attendees that a huge percentage of the sewer lines were designed to be on the road reserves • On the second question, Eng. Njuki responded that the proposed project was not going to be incorporated with the previous sewer systems as the pipes are non-interoperable with the current systems. Furthermore, the sewer systems that were done by the Ministry of Housing, were built considering the gravitational flow of sewer to a treatment plant at the Meru Teacher's College. The new system was designed to gravitate the waste to the new Rwanyange Sewer treatment plant.

Juster Tuntu	The previous road reserves were so narrow and this would compromise the ways for the sewer lines getting into farms	• In regards to the road reserves, a team from KURA responded that all the roads within Meru town were of standard with of 10 meters all accounting for the carriage way, footpath and drainage. She addressed the members who had encroached the road reserves to quit as this would lead to demolitions. She recommended that TWWDA and KURA should engage in order to acquire the right of ways for pipelines within the reserve.
Lydia Mwiti (Kenya Methodist Unversity)	Appreciated the projects and inquired how TWWDA is planning to engage institutions where the lines were designed to pass	• The proposed layout doesn't pass through institutions however whenever they would be forced by the designs to pass through the institution TWWDA will follow requisite procedures to acquire wayleave through the institution's management. Dedicated sewer trunks have been designed primarily to serve big institutions in Meru including: KeMU and Meru National Polytechnic
Samson Mwenda	The proposed projects potentiality to disturb the water supply lines as previous projects terminated their water supply infrastructure.	• Eng. Njuki responded that the previous projects implemented by TWWDA had not tampered with the water supply lines. Whenever the pipeline was disturbed, the agency through the Residential Engineer made efforts to repair the pipeline. He further responded that the project shall have grievance redress mechanism through which the community shall air out their concerns throughout the project implementation. The office responsible shall be situated at MeWaSS offices at the Water Treatment plant in Kinoru
Mr. Martin Gitari	Will the people near the main sewer trunk be connected directly to the sewer system?	• The technical team responded that it is not advisable to be connected to the sewer line directly via the main trunk as whenever the main trunk is tempered with, it would lead to a sanitation calamity. The community members were advised that whenever they would need a connection to the sewer line, they would be connected through application to MeWaSS which is the the WSP for Meru urban areas.

Mr. J Mureithi	Was concerned about the proposed works impacts on road disruptions as previous works conducted by MeWaSS had disrupted transportation	• It was responded that the proposed works would ensure that there is minimal inconveniences on the roads. There would be a dedicated marshal to ensure the roads are passable. The road crossings shall be executed through micro tunnelling minimising road cuttings
Alice Kaburu	Inquired if Gitoro village was included in the proposed LMC sewer Project	• Based on the surveyed layout, the village was not in the plan. However, the technical team assured that the village will be included in the future plans

MIN 5/07/03/2024: RECOMMENDATIONS

Mr. Geoffrey Mugambi gave a recommendation based on the fact that some of the lines will pass through private lands. He proposed that the RAP teams should notify the plot owners through the chief a few days prior to the exercise to ensure that the PAPs are available during the valuation process.

The community strongly urged the contractor and the donor to engage in open discussions with them to proactively address any potential water shortages that may arise during the construction phase as the proposed sewer line excavation terminates water supply pipes.

The community members made an appeal to the selected contractor, requesting that they prioritize the employment of local youth whenever job openings arise during the project's duration.

MIN 6/07/03/2024: CLOSING REMARKS

There being no other concerns, Mr Mutuma took the opportunity to assure the community members that their concerns and desires would be taken into serious consideration and integrated into the project's recommendations. He emphasized the importance of sustainability and acknowledged the community's invaluable input in shaping the project's outcomes. The consultant also encouraged the residents to welcome the contractor warmly once they report to the site, fostering a collaborative and positive environment for the project's implementation.

The ACC then officially concluded the meeting by thanking the team from TWWDA, MeWaSS and the consultants for enlightening and making them aware of the proposed project. She expressed sincere appreciation to everyone for their active participation and fruitful contributions throughout the session.

As all matters had been addressed, the meeting was adjourned at 12:40hrs with a word of prayer from Sr. Isabella.

MINUTES COMPILED BY:

Noel Koech Environmental Expert
NEMA Reg. No 11747
8th, March 2024

Sign …….

CONFIRMED BY:

LEAD EXPERT	**THE PUBLIC ADMINISTRATION**
Eng. Bernadett Wairimu NEMA Reg No. 7394 11th, March 2024	**ACC MERU MUNICIPALITY:** Madam Joyce Mwangi Date 12th March 2024

TANA WATER WORKS DEVELOPMENT AGENCY

Sign……	Sign …… ASSISTANT COUNTY COMMISSIONER MUNICIPALITY DIVISION P. O. Box 703 - 60200, MERU Stamp:… Date 12/3/2024……
TWWDA REPRESENTATIVE	
Eng. Kevin Njuki Project Engineer 11th March 2024 Sign……	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

TANA WATER WORKS DEVELOPMENT AGENCY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE: KINORU STADIUM HALL DATE: 7/03/2024 TIME: 10:00HRS

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
1	FRANCIS MBURUGU	Kaithe	7446351	0727217171	[signature]
2	Samson Mwenda	Kinoru	8871313	0722466457	[signature]
3	JOSHUA MUTI MINNITEA	NORTH IMENTI CONSTITUENCY	11026372	0724331589	[signature]
4	LAWRENCE KIRIINYA IBURI	Milimani/Kaaga	5973701	0722352543	[signature]
5	Rose Kabuu	Gitoro	16106870	0708440492	[signature]
6	JOHNSON MWENDA	KINORU	3465116	0727864729	[signature]
7	Stephen N Rukaria	Gitoro	7677640	0722861868	[signature]
8	Isabella Munyua	Kigure	7010737	0724670031	[signature]
9	Malcolm Kithinji	Nairobi womens	31880715	0715837312	[signature]
10	GITONGA LAWRENCE	KAITHE/KINORU	11696408	0723853778	[signature]
11	JOSIAH MACHARIA.	WEST WIND HOTEL LTD	23437951	0712467526	[signature]

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE ..... DATE..... TIME .....

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
12	MICHAEL MWIRIGI	MIRIMANI B	9907785	0710986874	
13	JAPHET MARANGU	UPPER KATHITA MIRIMANI WRUA	7758148	0711214778	
14	RICHARD MBUNGU	KIGURE	8882595	0721459509	
15	GATERE WA NJERI	KIGURE	3376584	0714646943	
16	GERALD M'ANGAINE	KIGURE	8885057	0721366436	
17	DAVID MUGIRI	KINORU MINOR	7670542	0721320172	
18	SR ISABELLA M	NAZARETH SRS G		0729441168	
19	JOHN THEURI	LIFECARE HOSPITAL	22337594	0705 066402	
20	PARMJIT SINGH RAYAT	LIFECARE HOSPITAL	24816666	0703153889	
21	SARAH KARIUKI	MAKUTANO	22650538	0718025671	
22	Joshua Muriuki Mungai	KAITHE	7731725	0722300739	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE ..... KINORU STADIUM HALL ..... DATE..... TIME .....

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
23	DAVID WANJOHI	KINORU	0254883	0722407356	
24	BEATRICE MURUKI	MILIMANI	2515627	0725630035	
25	Ayub Muriuki	Full Gospel Church of Kenya Makutano	2607247	0722871447	
26	Nicholas Kimmi Randa	Mili'mani	7794355	0727979596	
27	JOSEPH MURITHI DAVID	MILIMANI	7902078	0729874856	
28	ELIPHAS GITONGA MEME	MILIMANI	21477255	0712167557	
29	JOSEPHINE M- KAARIA	MILIMANI	8956508	0722634041	
30	JACINTA IC IGNOTI	IGURE	7670186	0729477076	
31	EUNICE K. MURERWA	KIGURE	23630731	0790292479	
32	ISAIAH MIRITI NJAMBIA	Kaithe Kinoru	2470334	0711940556	
33	KENO M MERU	KINORU/MILIMANI	22716701	0721213897	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE ....KINORU STADIUM HALL.... DATE.................... TIME ....

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
34	JAMES KINYUA	KINORU	8858500 ~~0745299757~~	0745299757	[signature]
35	DOUGLAS MURAMBI	KIGUIRE	8872800	0713955780	[signature]
36	NEWTON M. MUTEA.	MILLIMANI.	10899627.	0798897991	[signature]
37	Mercy Kathure	Kinoru	21799067	0727833534	[signature]
38	Nicholas Marcathimo	Kinoru	7862748	0723397797	[signature]
39	JOYCE MURIUKI	SIMBA WELLS	0979036	0722321267	[signature]
40	Kenneth murimi	mewass	37057186 0110637554	0110637554	[signature]
41	JACKSON KIMAITA	MEWASS	26506946	0720729950	[signature]
42	MUTUMA ABRAHAM	MILLIMANI	2364514	07246777	[signature]
43	Demiano mwithia	GITURO	263336	0723608259	[signature]
44	GERVASIO M'IGWETA	KINORU	8886957	0726-783-817	[signature]

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE: KINORU STADIUM HALL DATE: TIME:

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
45	BETH KIRUGI	KURA	(072) 27289428	0726219329	
46	Mary Caroline Muthoni	Technical dept KURA	32379375	0723834889	
47	Ex chief Kangu	Farmer	04430049 0722314400	0722314400	
48	Martin Gitari	Kaithe	1914 76 73	0722851448	
49	Peter Kiog.	KIGORE	8610488	072246262	
50	John K. M'mbwii	KIGURE	16042752	0729313535	
51	ALICE KINYA	Consolata hosp Gitoro	11542890	0713924924	
52	LYDIA NKIROTE MWITI	KEMU	10381733	0701027440	
53	Juliet Nyambura Kamuti	Kinoru	11752979	0723812360	
54	ANNRITA GAKII BUNDI.	Kinoru. RAKNA AGENCY	37843583	0798941419	
55	Geoffrey Muganbi Naituri	Gitoro	7769246	0726969154	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE ..... DATE..... TIME .....

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
56	MXXXXX NJERU	MILIMANI / KINORU	22289748	0722895889	
57	CATHRINE NKATHA	KIGURE / KINORU	10148441	0721409[illegible]	
58	Jason B. Ndwati	Equity Bank-Makutano	22938743	0763325755	
59	Rev. Solomon Gitonga	Gitoro	11059270 ~~0118899056~~	0111855056	
60	Silas Makinya	Milimani B	0517623	0723249214	
61	ZACHARY KARINGA	Silverspread hardwares Ltd	2488572	0722417468	
62	John Mburugu	Kinoru	4435316	0723847000	
63	THOMAS NDEREBA	MILIMANI/KINM	8304692	07241[illegible]437	
64	JOHN MBURUGU	KIGURE KINORU	7462617	0722288870	
65	GODFREY MURITHI	KINORU KIGURE	11697901	0720242968	
66	AYUB NDUMBA M.	MILIMANI/MEWAS	7071763	0725256475	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE ..KINORU STADIUM HAGG.. DATE..7/03/2024.. TIME ..10:00AM..

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
67	JOYCE NWANGI	INTERIOR	9946956	0723790324	
68	DAMIEL NETARA	INTERIOR	10343254	0720970279	
69	WILSON M KIRIGIA	INTERIOR	10486105	0720664615	
70	PETER MUREGA KAARIA	INTERIOR	23460882	0723542723	
71	ENG. KEVIN NJUKI	TUWSA	27446290	0727386499	
72	IRENE MUTAHI	TKWSA	30151521	0712792860	
73	NOAH KOECH	GNIL	33171988	0716864403	
74	MUTUMA MURITHI	GNIL	24957381	0720730095	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE KINORU STADIUM HALL DATE 7/03/2024 TIME 10:00 AM

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
67	JOYCE MWANGI	INTERIOR	9946956	0723790324	
68	DANIEL NETARA	INTERIOR	10343254	0720970279	
69	WILSON M KIRIGIA	INTERIOR	10486105	0720664615	
70	PETER MUREGA KAARIA	INTERIOR	23460882	0723542723	
71	ENG. KEVIN NJUKI	TWIDA	27446290	0722386444	
72	IRENE MUTAHI	TKIKIDA	30151521	0712792860	
73	NOEL KOECH	GNIL	33171928	0716864402	
74	MUTUMA MURITHI	GNIL	24957381	0720730095	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE KINORU STADIUM HALL DATE 07/03/2024 TIME 10:00 HRS

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
75	Douglas Kimathi	The Meru National Polytechnic	20255710	0716466715	
76	JUSTER KURIGO	AREA MANAGER TUMTU	7677593	0713268550	
77	Ronney Owuor	TAWDA	30146317	0719818182	
78	William Mwenda	Mewass Co.	24583048	0727523391	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE ....Meru....Municipal....Hall.... DATE....29/02/2024.... TIME ....2.00 PM....

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
	ROSE KARIO STEPHEN	Kongoacheke	2511847	0706101557	
	ALI Abu	Mjini	23068334	0710885869	
	Mohamed Koome	Mjini	29455618	0710683397	
	AMINA KAIRUTHI	Mjini	23'6458	0723992797	
	PAUL MURUTHI M	IKONCHWACHERE	7011899	0717423291	
	DOROTHY N. MUTEGI	ASS. CHIEF	24596473	0723428809	
	MARGARET K. GAKUBJ	CHIEF MUNICIPALITY	9854362	0721639352	
	CAROLINE KIRIMI	MEWASSCO	24279525	0725714418	
	ENG. KEVIN NOUKI	TWNDA	27496210	0727356649	
	Brian Kenneth Kori	INTERIOR	23496956	0705895718	
	GITANTAI KEVIN Kiogora	INTERIOR	34384445	0706340094	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE Meru municipal Hall DATE 29/07/2024 TIME 2:00 PM

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
	ENG. KEVIN NDUKI	TWWDA	27446290	0727386699	[signature]
	Bernadett Wairimu Njoroge	Greenville Nexus International Limited	24147035	0725928477	[signature]
	IRENE MUTAHI	TWWDA	30151521	0712792860	[signature]
	STELLA MACHARIA	TWWDA.	33569677	0725881696	[signature]
	Noel Koech	Associate Expert	23171998	0716816444	[signature]
	Jenifer Kain'ai	Kongoaceke	887766	0700214314	[signature]
	JOSEPH MWITI	KONGOACEKE	8432581	0724362251	[signature]
	Joan Kamenchu	KONGOACEKE	7677693	0728734442	[signature]
	JASITA chubiru	Kongoaceke	16122845	0703453746	Kn
	SADIA MOHAMED	MJINI	22226922	0726619470	sadia
	ZULEA MUSA	MJINI	20139114	0721760149	[signature]

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE DCC Board Room IMENTI NORTH DATE 28/02/2024 TIME 2:30PM

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
1	ROY MURITHI	MEWASS	26290584	0726387135	[signature]
2	MARTIN M MBAYA	NGAO	23333558	0706374160	[signature]
3	PETER MUREGA KAARIA	NGAO	23460882	0723542723	[signature]
4	SILAS KAUNGUTHA ARACHI	MWITERIA	11610649	0712159498	[signature]
5.	JOSPHINE K. MURUNGI	NGAO	13361983	0714041519	[signature]
6.	LUCY WANJA MAGIRI	NGAO	11327173	0701521420	[signature]
7.	MARY MWENDWA	NGAO	20082259	0724094430	[signature]
8	NAOMI Nkatha Mbutu	Kibaranyaki	8865793	0799768791	[signature]

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE DCC Board Room IMENTI NORTH DATE 28/02/2024 TIME 2:30 PM

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
1.	BRIAN MWENDA KIOGORA	ASST. CHIEF GAKOROMONE	27522790	07118583 01	
2.	DORIS MULEKYO KIEKE	MEWASS	21451708	0710845973	
3	ELIZABETH Kainini	MEWASS	13401846	0726339409	
4	Anthony G. Kimani	MEWASSCO	25928713	0726605070	
5	STELLA M. KINOTI	CHIEF-KATHERICENTRE	11607328	0711988545	
6	WILSON MUTHOMA	CHIEF KIBA RAINBOW LOC	11607485	0711507242	
7	Vincent Mbaor	MEWASCO	32261530	0792331256	
8	JAMES MWEKERA KINYUA	AREA MANAGER Kaga	8458452	0721249546	
9	WILSON MWITI KURIGIA	ASST CHIEF IGNORU	10486105	0720664615	
10	DOUGLAS MUGAMBI	AREA MANAGER IGNORU	8872800	0713955780	
11	[illegible]	AREA MANAGER UPPER IGOKI	88886607	0723915552	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE DCC Board Room IMENTI NORTH DATE 28/02/2024 TIME 2:30 PM

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
1					
2					
3	JOYCE MWANGI	INTERIOR	9946956	0723790 324	
4	LUCAS MUANGE	INTERIOR	20270712	0724296458	
5	JUSTER KURIGO	INTERIOR	7677593	0713268550	
6	DANIEL NTARA	INTERIOR	10343254	0720970209	
7	MARGARET KAIRUTHI GALVRI	INTERIOR	9854362	0721639352	
8	ZEPHANIAH M. NYAMU	KONJO/GAKOROMA	31247472	0743249373	
9.	MUSIAFA GITONGA	CHAIRMAN MUNICIPALITY	9524219	0727880876	
10	ISAAC KITHINJI KINYUA	INTERIOR	11258987	0728097517	
11	GEORGE M. MATHU	INTERIOR	8305456	0727081336	

THE NATIONAL URBAN WATER SUPPLY AND SANITATION PROGRAM)
SITE SPECIFIC STUDIES, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT(ESIA) AND RESETTLEMENT ACTION PLAN (RAP) FOR PROJECTS IN MERU COUNTY

PROJECT: PROPOSED LAST MILE CONNECTIVITY OF MERU SEWERAGE PROJECT

PUBLIC PARTICIPATION LIST

VENUE NCC Board Room IMENTI NORTH DATE 28/02/2024 TIME 2.30 PM

S/ No.	NAME	VILLAGE/INSTITUTION	ID No	CONTACTS	SIGN
	JOHN RUNDI KIREBA	KATHITA SUB/LOC	7457161	0727659757	
	STANLEY GITONGA	KIONYO KATHERI AREA MANAGER	2360280	0722494536	
	JOSHUA MWENDA IKIARA	AREA MANAGER KIOME ID MBO/WEST	22029267	0726989472	
	SHADRACK MWONGERA MUTHUR.	CHIEF KITHIRUNE WEST MBO-WEST WARD	13359939	0728009231	

F

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

Proposed Last Mile Connectivity of Meru Sewerage Project

Tana Water Works Development Agency (TWWDA) is one of the nine (9) water Agencies under the Ministry of Water, Sanitation and Irrigation which is supporting the government in developing, maintaining, and managing national public water works to attain sustainable access to quality water and improved sewerage services within its area of jurisdiction. As part of its strategic plan, TWWDA is committed to increase the water and sewerage coverage in its area of jurisdiction from 57.8% and 8.1% in 2023 to 90% and 30% by 2027 respectively through development of sustainable Water and Sanitation Infrastructure

TWWDA has identified various water and sewerage projects within its area of jurisdiction to be undertaken under the National Urban Water Supply and Sanitation Program (NUWaSSaP) and have engaged the services of a consultant to undertake review and site-specific studies, Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) for implementation of the above proposed project. The implementation of the project is to be funded by the African Development Bank (AfDB) and the Government of Kenya (GoK). As a prerequisite for project funding and subsequent implementation, ESIA and RAP studies have to be undertaken and the reports approved.

As a member of the local community / surrounding enterprise / interested party, we request your comments on the expected socio-economic and environmental impacts of the proposed project. As a requirement of the AFDB Integrated Safeguards System, the Environmental Management and Co-ordination Act (1999), the Environmental (Impact Assessment and Audit) Regulations (2003) revised in 2015, Relevant Environmental and Social Policies, Public Health Act and Legal Supplement 2003, on environmental impact assessment, public participation is an important exercise for achieving the fundamental principles of sustainable development.

(Please note that these details are required for the purposes of authenticity in relation to the proposed project)

a) What is the distance between your house/enterprise and the project site? (*Tick where applicable*)

Less than 100m ☐ 100 – 500m ☐ 501 -1000m ☐ Over 1Km ☑

b) Are you familiar with the activities that would be involved in the Proposed Project?

Yes ☑ No ☐

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes ☑ No ☐

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes ☑ No ☐

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

i) Good and Clean environment.

ii) There is going to be good waste Management and at the end there is good & fresh air.

.....

.....

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

i) There could arise some complains if people are not aware of the impact of the project.

ii) Incase of leakages of wastes there could be health hazards.

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

ii) Make sure there is safety of the people in the surroundings areas incase of digging of ditches or trenches.

ii) Ensure that there is proper disposal of wastes to avoid health hazards.

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

i) To create awareness to the community on how the sewerage is going to benefit them.

ii) To use the local people as the casual labourers inorder to embrace and own the project.

Name: NAZARETH SISTERS Date: 22/03/2024

Designation / Residence: KISORU.

Contact: 0724 398 615

Signature: [signature]

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

Proposed Last Mile Connectivity of Meru Sewerage Project

Tana Water Works Development Agency (TWWDA) is one of the nine (9) water Agencies under the Ministry of Water, Sanitation and Irrigation which is supporting the government in developing, maintaining, and managing national public water works to attain sustainable access to quality water and improved sewerage services within its area of jurisdiction. As part of its strategic plan, TWWDA is committed to increase the water and sewerage coverage in its area of jurisdiction from 57.8% and 8.1% in 2023 to 90% and 30% by 2027 respectively through development of sustainable Water and Sanitation Infrastructure

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(Please note that these details are required for the purposes of authenticity in relation to the proposed project)

a) What is the distance between your house/enterprise and the project site? (*Tick where applicable*)

Less than 100m ☐ 100 – 500m ☑ 501 -1000m ☐ Over 1Km ☐

b) Are you familiar with the activities that would be involved in the Proposed Project?

Yes ☑ No ☐

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes ☐ No ☑

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes ☑ No ☐

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

.....

Clearing of the sewerage plan over homes

.....

.....

.....

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

.....
.....
.....None.....
.....
.....
.....
.....

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

.....No.....
.....
.....
.....
.....
.....
.....

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

.....
.....None.....
.....
.....
.....
.....
.....

Name: Simon Mutua Date: 22/03/2024

Designation / Residence: Makueni

Contact: 0721278161

Signature: SM

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

Proposed Last Mile Connectivity of Meru Sewerage Project

Tana Water Works Development Agency (TWWDA) is one of the nine (9) water Agencies under the Ministry of Water, Sanitation and Irrigation which is supporting the government in developing, maintaining, and managing national public water works to attain sustainable access to quality water and improved sewerage services within its area of jurisdiction. As part of its strategic plan, TWWDA is committed to increase the water and sewerage coverage in its area of jurisdiction from 57.8% and 8.1% in 2023 to 90% and 30% by 2027 respectively through development of sustainable Water and Sanitation Infrastructure

TWWDA has identified various water and sewerage projects within its area of jurisdiction to be undertaken under the National Urban Water Supply and Sanitation Program (NUWaSSaP) and have engaged the services of a consultant to undertake review and site-specific studies, Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) for implementation of the above proposed project. The implementation of the project is to be funded by the African Development Bank (AfDB) and the Government of Kenya (GoK). As a prerequisite for project funding and subsequent implementation, ESIA and RAP studies have to be undertaken and the reports approved.

As a member of the local community / surrounding enterprise / interested party, we request your comments on the expected socio-economic and environmental impacts of the proposed project. As a requirement of the AFDB Integrated Safeguards System, the Environmental Management and Co-ordination Act (1999), the Environmental (Impact Assessment and Audit) Regulations (2003) revised in 2015, Relevant Environmental and Social Policies, Public Health Act and Legal Supplement 2003, on environmental impact assessment, public participation is an important exercise for achieving the fundamental principles of sustainable development.

(Please note that these details are required for the purposes of authenticity in relation to the proposed project)

a) What is the distance between your house/enterprise and the project site? (*Tick where applicable*)

Less than 100m [✓] 100 – 500m [ ] 501 -1000m [ ] Over 1Km [ ]

b) Are you familiar with the activities that would be involved in the Proposed Project?

Yes [✓] No [ ]

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes [ ] No [✓]

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes [✓] No [ ]

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

.....Not in the area and very.....
.....small so it very positive to avoid.....
.....pit latrine.....
.....
.....

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

~~A~~ N/A

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

To identifies the service lines in minor plots

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

Name: EDWARD MUITI GIKUNA Date: 22/3/2024

Designation / Residence: KINORU

Contact: 0720633411

Signature: [signature]

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

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a) What is the distance between your house/enterprise and the project site? (*Tick where applicable*)

Less than 100m [✓] 100 – 500m [ ] 501 -1000m [ ] Over 1Km [ ]

b) Are you familiar with the activities that would be involved in the Proposed Project?

Yes [✓] No [ ]

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes [ ] No [✓]

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes [✓] No [ ]

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

1. Improvement of sanitation.
2. Our stream will be Clean.

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

1. Dust
2. Impassable Roads

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

1. Water the road to reduce dust.
2. Complete work on time to allow us pass.

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

None

Name: Derrick Khwatsi Date: 22/03/2024

Designation / Residence: Kwanza

Contact: 0726999048

Signature:

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

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b) Are you familiar with the activities that would be involved in the Proposed Project?

Yes ☑ No ☐

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes ☐ No ☑

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes ☑ No ☐

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

1. Reduce exhausting .....
2. .....
.....
.....
.....

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

None

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

None

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

N/A

Name: Franjaline Mwiringi Date: 22/03/2024

Designation / Residence: Kinoru

Contact: 0722933400

Signature:

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

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b) Are you familiar with the activities that would be involved in the Proposed Project?

Yes ☑ No ☐

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes ☐ No ☑

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes ☑ No ☐

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

.....The project will improve.....
.....the commite more.....
.....
.....
.....

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

Damage water pipes and Road damages

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

Replacing broken pipes and repairing roads around the area affected.

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

NO.

Name: STEPHEN OMBASO Date: 21/3/24

Designation / Residence: KINORU

Contact: 0740738197

Signature: [signature]

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

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b) Are you familiar with the activities that would be involved in the Proposed Project?

Yes ☑ No ☐

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes ☐ No ☑

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes ☑ No ☐

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

None.
Disruption of logistics activities
for a while

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

Normal disruption of logistic activities

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

Information about imminent disruptions of logistics during construction.

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

Just ensure water pipes are repaired after construction of the sewer systems.

Name: Kenneth Kimathi Date: 22/03/2024

Designation / Residence: Resident - Kamba Kia

Contact: 0740669128

Signature:

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

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Yes [✓] No [ ]

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes [✓] No [ ]

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes [✓] No [ ]

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

1). Creat Jobs to our Skilled and unskilled youths.....
2). Small business will emerge e.g. marketing fruits + ready food
3). Our Grading of the Stadium - Water tank treatment road.....
4). Increase of income less private exhausting.
5) Widening of the road.

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

1) Road will be unpassable during construction.
2) Difficult in accessing Premises.
3) Interferance with other infrastructures e.g. water supply.

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

1) Serve notice Prior to Construction concerning activities to be done.
2) Repair of Water Pipes if interfered with at the end of every day.
3) Leave Entrance to Premises accessable.

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

1) The Project will improve income and value to real estate business.
2) Install manholes to serve every plot accordingly.
3)

Name: Beatrice Munuci Date: 22-03-2024

Designation / Residence: Milimani (Next to Stadium)

Contact: 0725 630035

Signature:

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

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b) Are you familiar with the activities that would be involved in the Proposed Project?

Yes ☑ No ☐

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes ☐ No ☑

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes ☑ No ☐

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

.....

..... A good service .....

.....

.....

.....

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

.....
.....
.....
.....IT CAN DAMAGE OUR WATER.....
.....
.....PIPES.....
.....

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

.....
.....
.....ONLY TO HELP AS TO REPAIR.....
.....
.....OUR PIPE ONLY.....
.....
.....

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

.....
.....
.....
.....NO.....
.....
.....
.....

Name: JOHNSON F MWENDA Date: 22/3/2024

Designation / Residence: KIMORU

Contact: 0727864729

Signature:

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

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Yes ☑ No ☐

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes ☐ No ☑

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes ☑ No ☐

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

- Employment For youths.
- Water Supply to the Communities
- treatment of harmful sewer.

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

- LAND Digredation.
- plants and animals displacement.

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

- Environmental Factors consider
leaving the land utilised as it was
- Sewer Sewer spillage should be
minimized upon

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

- Social corporate services to
the community

Name: Ghantai Date: 29/2/2024

Designation / Residence: MERU.

Contact: 0706340094

Signature:

THANK YOU FOR YOUR RESPONSE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) QUESTIONNAIRE FOR LOCAL COMMUNITY MEMBERS/ SORROUNDING ENTERPRISES/INTERESTED PARTIES

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b) Are you familiar with the activities that would be involved in the Proposed Project?

Yes ☑ No ☐

c) Do you think you and your enterprise will be affected by the above proposed project?

Yes ☑ No ☐

d) Do you think this proposed project is suitable and compatible with the surrounding developments?

Yes ☑ No ☐

e) What **POSITIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project:

Increasing the number of People with access to clean and safe drinking water and sewerage systems.

f) What **NEGATIVE** socio-economic and environmental impacts do you anticipate during the construction and operation stages of the project?

Environmental degradation especially during the digging process

g) Make suggestions on the measures that the developer needs to put in place during the construction/setting up and operation stages.

Adherance to NEMA Guidelines to ensure the rehabilitation process is a success

h) Any other **comments/suggestions** you would like to make in relation to the proposed project activities?

Please give jobs to the locals for maximum Project support

Name: Brian Kenneth Kori Date: 29/2/2024

Designation / Residence: Assistant County Commissioner

Contact: 0705898718

Signature:

THANK YOU FOR YOUR RESPONSE

EIA23062805

nema
Mazingira Yetu | Uhai Wetu | Wajibu Wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

CERTIFICATE OF VARIATION OF ENVIRONMENTAL IMPACT ASSESSMENT LICENSE

Certificate No: **NEMA/EIA/VC/2187**

Application Reference No: **NEMA/EIA/VEIA/3529**

This is to certify that the Environmental Impact Assessment License No **NEMA/EIA/PSL/8525** issued on 9/27/2019

to **Tana Water Services Board.**

of

P.O.Box 1292- 10100, Nyeri.

regarding

Proposed Meru Sewerage Project.

whose objective is

Establishment of Meru sewerage network of approximately 52.6km involving the construction of new sewerage conveyance facilities, a waste water treatment plant,an office block with a laboratory, 9No. staff houses and associated infrastructure.

located at

Meru Town in Meru County.

has been varied to

Extend the EIA License validity period by an additional twenty four (24) months to allow completion of the project subject to conditions on EIA License No. NEMA/EIA/PSL/8525 and the additional condition overleaf.

with effect from **03 May, 2024** in accordance with the provisions of the Act.

Date: **03 May, 2024**

Signature

(Seal)

Director-General

The National Environment Management Authority

P.T.O.

ISO 9001 : 2015 Certified

1. The proponent shall **undertake annual Environmental Audit (EA)** to ascertain the efficacy of the impacts mitigation measures proposed in the Environmental and Social Management Plan (ESMP) and report compliance to the Authority by submitting the EA report within the first year of commencement/commissioning as stipulated in the EIA License and Section 68 (3) & (4) of EMCA, 1999 and Regulations 31 of the EIA/EA Regulations, 2003.

nema

mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY (NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESMENT LICENSE

License No: NEMA/EIA/PSL/8525

Application Reference No: NEMA/EIA/SR/1477

This is to certify that the Environmental Impact Assessment Study Report received from

Tana Water Services Board.

P.O Box 1292 - 10100, Nyeri.

submitted to the National Environment Management Authority in accordance with the Environmental Impact Assessment & Audit Regulations, 2003 regarding the:

Proposed Meru Sewerage Project.

whose objective is to carry on

Establishment of meru sewerage network of approximately 52.6km involving the construction of new sewerage conveyance facilities, a waste water treatment plant, an office block with a laboratory, 9No. staff houses and associated infrastructure.

located at

Meru Town in Meru County.

has been reviewed and a license is hereby issued for the implementation of the project, subject to attached conditions.

Issue Date : **27 September, 2019**

Signature

(Seal)

Director-General
The National Environment Management Authority.

P.T.O.

ISO 9001: 2008 Certified

1.0 General Conditions

1.1 The development is for the construction of New Sewerage conveyance facilities and a Waste Water Treatment Plant (WWTP) involving construction of a sewer network of approximately 56.2km of trunk sewer and manholes, inlet channel with screens, grit channel, waste stabilization ponds, overflow chamber, sludge drying beds, office block with a laboratory, two double grade 9No. staff houses and associated infrastructure in Meru County.

1.2 The license shall be valid for 24 months (time within which the project shall commence from the date hereof).

1.3 The Director General shall be notified of any transfer, variation or surrender of this license.

1.4 This license shall not be taken as statutory defence against charges of environmental degradation or pollution in respect of any manner of degradation/pollution not specified herein.

1.5 The proponent shall ensure that records on conditions of licenses/approval and project monitoring and evaluation shall be kept on the project site for inspection by NEMA's Environmental Inspectors.

1.6 The proponent shall submit an Environmental Audit report in the first year of occupation/operations/commissioning to confirm the efficacy and adequacy of the Environmental Management Plan.

1.7 The proponent shall comply with NEMA's improvement orders throughout the project cycle.

1.8 The proponent shall ensure strict adherence to the Environmental Management Plan developed throughout the project cycle.

2.0 Construction Conditions

2.1 The proponent shall put up a project signboard as per the Ministry of Transport and Infrastructure standards indicating the NEMA license number among other information.

2.2 The proponent shall ensure that all excavated material and debris is collected, re-used and where need be, disposed off as per the Environmental Management and Coordination (Waste Management) Regulations of 2006.

2.3 The proponent shall obtain requisite approvals from Water Resource Authority and any other relevant agency for section where the sewer line crosses a river and submit copies of the same to NEMA.

2.4 The proponent shall ensure relocation, compensation and restoration of livelihoods for any project affected persons and develop a consultative plan for emerging issues and grievance redress mechanism as shall be prescribed in the Resettlement Action Plan (RAP).

2.5 The proponent shall ensure strict adherence to the provisions of Environmental Management and Coordination (Noise and Excessive Vibrations Pollution Control) Regulations of 2009.

2.6 The proponent shall ensure strict adherence to the Occupational Safety and Health Act (OSHA), 2007.

2.7 The proponent shall ensure that construction workers are provided with adequate personal protection equipment (PPE), as well as adequate training.

2.8 The proponent shall ensure that construction activities are undertaken during the day(and not at night) between 0800hours and 1800 hours and on Saturdays between 0800 hours and 1300 hours. No works shall be undertaken on Sundays and that transportation of construction materials to and from the site are undertaken during weekdays and Saturdays only during the hours specified herein.

2.9 The proponent shall ensure that the development adheres to zoning specifications issued for development of such a project within the jurisdiction of County Government of Meru, with emphasis on approved land use for the area.

3.0 Operational Conditions

3.1 The proponent shall ensure that the sewer system has capacity to treat all waste discharged to the sewer line to the required standards before discharge to the sewer line.

3.2 The proponent shall ensure that clients pre-treat effluent to required standard before discharge to the sewer line, in accordance with Environmental Management and Co-ordination (Water Quality) Regulations, 2006.

3.3 The proponent shall obtain effluent discharge license from NEMA within the first year of operation.

3.4 The proponent shall ensure that the chemicals used in the sewage treatment are appropriately disposed of as prescribed in their respective material safety data sheets.

3.5 The proponent shall ensure that all drainage facilities are fitted with adequate functional oil water separators and silt traps.

3.6 The proponent shall ensure that all equipment used are well maintained in accordance with the Environmental Management and Coordination (Noise and Excessive Vibration Pollution Control) Regulations of 2009.

3.7 The proponent shall ensure that all solid waste is handled in accordance with the Environmental Management and Coordination (Waste Management) Regulations of 2006.

3.8 The proponent shall ensure that all workers are well protected and trained as per the Occupational Safety and Health Act (OSHA) of 2007.

3.9 The proponent shall comply with the relevant principal laws, by-laws and guidelines issued for development of such a project within the jurisdiction of the County Government of Meru, Ministry of Transport and Infrastructure, Ministry of Health, Directorate of Occupational Health and Safety Services, Water Resources Management Authority and other relevant Authorities.

3.10 The proponent shall ensure that environmental protection facilities or measures to prevent pollution and ecological deterioration such as energy conservation measures, pollution control mechanisms, catchment/riparian protection mechanisms are designed, constructed and employed simultaneously with the proposed project.

4.0 Notification Conditions

4.1 The proponent shall seek written approval from the Authority for any operational changes under this license.

4.2 The proponent shall ensure that the Authority is notified of any malfunction of any system with 12 hours on the NEMA hotline **020 6006041/0786101100** and mitigation measures put in place.

4.3 The proponent shall keep records of all pollution incidences and notify the Authority within 24 hours.

4.4 The proponent shall notify the Authority in writing of its intent to decommission the facility **three (3) months** in advance.

5.0 Decommissioning Conditions

5.1 The proponent shall ensure that a decommissioning plan is submitted to the Authority for approval at least three (3) months prior to decommissioning.

5.2 The proponent shall ensure that all pollutants and polluted material is contained and adequate mitigation measures provided during the phase.

The above conditions will ensure environmentally sustainable development and must be complied with.